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A survey of computer usage in year 11 and 12 accounting in Western Australian secondary government schools

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**A SURVEY OF COMPUTER USAGE IN YEAR 11 AND 12 ACCOUNTING
IN WESTERN AUSTRALIAN SECONDARY GOVERNMENT SCHOOLS**

BY

GRAZYNA CRITCH

**A Thesis Submitted in Partial Fulfilment of the Requirements
for the Award of**

BACHELOR OF EDUCATION (HONOURS)

**at the School of Education, Western Australian College
of Advanced Education.**

Date of Submission: 8 December 1989

ABSTRACT

Computer technology has changed the process of accounting and as a result computer usage has become an essential skill for the accountant. Consequently, computer applications are advocated in the accounting curriculum, the vocational rationale verified by virtue of the fact that the accounting profession itself is calling for computer training as part of accounting education.

Although there is widespread agreement about the need for computer usage within accounting education, there is often a dichotomy between the educational goal and its application in practice. This is because computer usage in accounting is not without problems; while there are many factors which encourage its use, there are also many impinging on its use.

The research focussed on the extent of computer usage within the accounting curriculum of government secondary schools in Western Australia. Evidence was sought by means of a questionnaire to accounting teachers in senior high schools within the metropolitan area. Respondents were asked to indicate the degree of computer usage within the Year 11 and 12 Accounting syllabus and to identify problems preventing its use.

The results of the survey suggest that while the computer is being used in some schools, a commitment to computer use in accounting requires more than the provision of computers to schools. In those schools where computers are currently not being used, lack of time, a shortage of quality software and insufficient inservice training are given as reasons for not employing computers in the curriculum. While the existence of a sufficient number of computers is necessary, resources alone are no guarantee of its use. A crucial factor is whether the available software is capable of the application required of it. And ultimately, what is actually done in the classroom will depend more on the attitude of the accounting teacher rather than the available resources.

The contribution made by this research is significant in that it provides valuable information which appears to be lacking at present. For while the use of electronic data processing is an educational objective of the accounting curriculum of senior high schools, there is no evidence of the extent to which this objective has been implemented in the classroom.

DECLARATION

"I certify that this thesis does not incorporate, without acknowledgement, any material previously submitted for a degree or diploma in any institution of higher education and that, to the best of my knowledge and belief, it does not contain any material previously published or written by another person except where due reference is made in the text".

GRAZYNA CRITCH

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1 INTRODUCTION

- 1.1 Historical Background
- 1.2 Purpose and Significance of the Research
- 1.3 Statement of the Problem
- 1.4 Definition of Terms
- 1.5 Research Questions
- 1.6 Limitations to the Research
- 1.7 Assumptions Underlying the Research

1 INTRODUCTION

The development of the computer and the resultant computer technology has revolutionized the accounting function and radically affected the environment in which accounting operates today. The manual method of processing financial data has been replaced by electronic means and computer usage has become an essential skill for accountants. As a result, it has been recognized that students in accounting courses need to gain a basic understanding of the computer. To achieve this, the accounting curriculum has been modified to include computer applications.

This research focuses on the use of computers in accounting education. The aim of the research is to survey computer use in Year 11 and 12 Accounting in Western Australian secondary schools in order to highlight the extent to which the computer has been implemented within the accounting curriculum. If computer usage is not a part of accounting education, the results of the research should signify why.

1.1 HISTORICAL BACKGROUND

The development of the computer has been acclaimed as the most important technological development of the 20th century, a development that has succeeded in "multiplying human brainpower with the same impact that the industrial revolution had in multiplying human muscle power". (O'Brien, 1979, p. 24). This is not surprising because as Rothery (1971, p. 3) says, "the computer is the super machine, without a doubt the nearest thing to an imitation of man's intelligence and by far faster than any man or group of men at routine work".

The accelerated growth of the computer industry shows that society has accepted the computer's role and has become dependent on its ability to perform various tasks. Kupsh and Rhodes (1987, p. 376) estimate that by the end of the century 90 per cent of the workforce in the United States will be in the automated office, and in the office or elsewhere, 80 per cent of the workforce will use some type of terminal one or more times a day.

Within business and industry, the expanding use of computers has resulted in significant changes within the accounting environment and the need for an evaluation of the accounting curriculum.

1.11 Implication of Computers on the Accounting Profession

Computer technology has changed the way in which accounting is performed. Although the basic principles remain the same the computer has replaced many of the hand operations of accounting. Through the use of menu-driven software and a few input strokes, detailed ledgers are produced with all postings complete and financial statements roll off printers at lightning speed. As a result "the ancient days of long hours devoted to tedious tasks of journal entries, ledger posting and trial balances are almost a thing of the past". (Shafer, 1987, p. 7).

Not only is the computer an integral tool of the accounting environment, but the vast capabilities of the computer makes it easier to have access to data which previously could only be assembled by the accountant. Electronic processing of transactions and the development of on-line data banks into which many employees can concurrently enquire, removes the exclusive control of financial information accountants had. The accountant is now exposed to competition from others with equal access and to maintain dominance in the area of financial management must become the best user of financial information. To do so accountants must have computer skills and, in fact, employers expect them to have these skills. (Parmley & Parmley, 1987; Simmons & Hart, 1988).

1.12. Implication of Computers on Accounting Education

If computer skills are essential for the accountant then the traditional objectives of the accounting curriculum need to be expanded to provide for this.

Traditionally, accounting education has focussed almost entirely upon the routine data collection and manipulation processes associated with bookkeeping. The approach was to treat accounting as a skill and was based on the belief that accounting is what accountants do. In the past accountants did manually manipulate data in order to produce useful information. But the role of the accountant in business has changed. "The old image of the accountant hunched over paper work on the desk, wearing a green visor, is passe". (Fordham & White, 1987, p. 17). The traditional approach to teaching accounting is, therefore, no longer appropriate and computer applications need to be integrated into the curriculum. The vocational rationale for computer use in accounting is justified by virtue of the fact that the accounting profession itself is calling for graduates to be trained in computer use.

1.2 PURPOSE AND SIGNIFICANCE OF THE RESEARCH

The purpose of this research is to survey the use of computers in Year 11 and 12 Accounting in Western Australian secondary government schools. Given that computers have brought about unprecedented changes to the accounting environment and that the education system needs to respond to the changing needs of the accounting profession, the research will show whether this has actually resulted in any meaningful computer activity in the schools. If, as cited by Hannafin, Dalton & Hooper (1987, p. 8), the impetus for computer use has had little impact, the results of this research should help to explain why.

The Year 11 and 12 Accounting syllabi provide for raising students' awareness of electronic data processing and developing computational skills. Computer use is mandatory within Year 11 Accounting and a specific time weighting is given for its inclusion within the course. No guidelines exist, however, as to how it is to be achieved. Given the nature of schools and their historical reluctance to change, the research will initially address the extent to which computers are actually being used. As there appears to be little information about computer use in Western Australian schools at present, the contribution made by this research should be quite significant.

It is envisaged that the results of the research will both highlight the existing 'status quo' and help to explain it as the survey will ask respondents to identify any problems preventing them make use of computers within the accounting curriculum. And since teachers have had very little or no guidance for implementing computer applications, the results of practices by Accounting teachers may be used to either modify existing computer usage programmes or to develop such programmes in schools where none exist.

The focus of this survey is on government schools alone. The intention of the research is to provide a framework of information in an area where little exists. As a result the research sample, rather than being limiting is considered sufficiently adequate to provide valuable information on computer use at present and establish the framework for a follow-up study of all schools in Western Australia in the future. Although initially designed for accounting teachers in government schools, in terms of a wider audience, it is possible that any generalizations from this study could be applicable for all schools in Western Australia which offer Accounting at the secondary level.

1.3 STATEMENT OF THE PROBLEM

Among many developments to make education relevant to acute need, the Beazley Committee of Inquiry into Education in Western Australia (1984) recognized the importance of computer education. A major conclusion of the Committee was that as computer technology pervades almost all facets of life, it is a technology that students need to understand and learn how to use and, therefore, "all schools and school systems should develop and implement policies for computer usage". (Beazley Report, 1984, p. 31). As a result of the Beazley Inquiry (1984) and the Better Schools Policy (1987), the Ministry of Education formulated an education policy to improve computer education in Western Australian schools by committing itself to providing computers to all schools to ensure more access for students to computer equipment.

At the same time the Secondary Education Authority (SEA) revised the syllabus for Accounting in the upper secondary school to include computer applications. It was recognized that the computer is playing an ever increasing role in the processing of business data and that if as a result the accounting profession needs computer skills, then students in Accounting courses need to gain a basic understanding of computers. To this extent, SEA requirements provide for some computer use as part of the specific objectives of the Accounting syllabus. Given that the Ministry's computer

policy seeks to provide more student access to computers and that an attempt has been made within the Accounting syllabus to keep pace with changes occurring in the real world, then every government secondary school offering Accounting at the upper secondary level should have responded by including computer usage as part of the Accounting curriculum.

The problem is that although there are written policies by the Ministry of Education and the SEA with reference to computer usage, it is not known to what extent students in Accounting courses are actually making use of computers in their studies. Moreover, the application of any curriculum initiative is dependent not only on a curriculum statement from theorists but also on the actual implementation of this initiative in schools. This depends on teacher goodwill, teacher expertise, and in the case of computer usage, the provision of suitable hardware and software. An application from curriculum theory to curriculum practice cannot be automatically assumed. The focus of this research is, therefore, to survey what impact, if any, the impetus for computer usage has had on Accounting programmes in secondary schools by examining to what extent the innovation to promote computer applications has actually been implemented.

1.4 DEFINITION OF TERMS

The following terms relating to computers are used within this research. To clarify the intent of the author and to provide meaning for the terms in context, the definitions are given below.

1.41 Computer

A computer is defined as "a collection of electronic devices capable, under the control of a program of instruction, of carrying out arithmetic, manipulative and processing operations on business data". (Rowan, 1982, p. 14).

1.42 Computer Literacy

Computer literacy is "an informed state of awareness of computer technology" including the principles of operation and application. (Education Department, 1984, p. 1).

1.43 Computer Applications

Within the accounting curriculum, computer applications involve the use of the computer in conjunction with computer software in order to process financial data at an elementary level.

1.44 Computer Software

Computer software is a collective term to refer to computer programmes. A computer programme is a set of instructions to be followed by a computer in processing data or performing a specific task. (Kirkwood, Ryan, Falt & Stanley, 1987, p. 876).

1.45 Electronic Data Processing

Data processing is "the system of recording, collecting and saving data and the subsequent sorting, summarizing and retrieval of that data". (Hollmann & Thomas, 1989, p. 411). The processing of data through a computer at great speed and with a minimum of human effort and intervention is electronic data processing.

1.5 RESEARCH QUESTIONS

To survey present trends, the research poses the following questions, the answers to which should highlight the degree of computer use in Accounting education. If computer usage is not evident, then the research should explain why not.

1. To what extent is computer literacy a part of the Accounting curriculum?
2. Are Accounting teachers actually using computers within the Accounting curriculum?
3. What specific uses are made of the computer by Accounting teachers within the Accounting curriculum?
4. Are there factors which prevent Accounting teachers from incorporating computers within Accounting education? If so, what are the factors?
5. What resources are available to enable Accounting teachers to integrate computer use within the Accounting curriculum?
6. Do Accounting teachers perceive any benefits resulting from computer use in the Accounting curriculum? If so, what are the benefits?

1.6 LIMITATIONS TO THE RESEARCH

The method chosen for this research is the survey approach. One serious limitation of the survey approach is the lack of evidence about causality; it is generally not possible to prove causality even with a representative sample. This method, therefore, contributes little to our understanding of which of the underlying factors are influential to the results without a complex statistical analysis undertaken. In this research the analysis involves little more than simple tabulation and presentation of results. For the scope of this research, however, the survey method is adequate and although direct cause-effect may not be able to be clearly established, where one event is invariably followed by another, it may be inferred.

Another limitation of this research is related to sample size. However carefully the sample is selected, it is inevitable that slight differences between sample and population will occur. The smaller the sample, the more likely to produce results different from the population, whereas the larger the sample, the less the sample error, and the more precise will be the generalizations based on the sample. In this research the sample will consist of senior high schools in the metropolitan area. It is hoped that the results obtained will truly reflect the population statewide and that the returns from the sample are large

enough to be able to make reliable generalizations about computer usage within the Accounting curriculum possible.

Within the research, survey data is to be collected by use of the questionnaire. The main weakness of a questionnaire is that it is mailed and inevitably a proportion of the sample will not respond. Yet the percentage response is a most important consideration in evaluating a questionnaire. A survey with much less than a 70% response rate reduces the ability to generalize the results of the study to a larger sample. A limitation exists, therefore, in the very nature of the instrument.

Moreover, even if the questionnaire is returned, there is little assurance that all responses will be truthful. Respondents may also not answer all questions asked or, if they do, may not answer them completely. Design and pre-testing procedures have been used to improve the quality and the usefulness of the questionnaire and to control the biases of the respondents, but these affects cannot be known until the survey is returned.

1.7 ASSUMPTIONS UNDERLYING THE RESEARCH

The research is based on several assumptions which are reflected in the following statements:

1. The increasing use of computers in business has revolutionized the accounting function and radically affected the accounting environment.
2. Computer literacy has become an essential skill for accountants and as a result, students of Accounting need to gain a basic understanding of computers.
3. The Beazley Committee of Inquiry (1984) and the Better Schools Policy (1987), have resulted in increased computer facilities for all secondary schools in Western Australia.
4. All upper school Accounting programmes in Western Australian government secondary schools reflect the objectives of the Secondary Education Authority (SEA).
5. The impetus for computer usage by both the Ministry of Education and the SEA, has resulted in computer use in the Accounting curriculum of government secondary schools in Western Australia.

2 LITERATURE REVIEW

- 2.1 Rationale For Computer Education
- 2.2 Provision of Computers in Education
- 2.3 Computers in Accounting Education
- 2.4 Teachers' Attitudes Towards Computers
- 2.5 Implications and Conclusions

2 LITERATURE REVIEW

In recent years, increased attention has been directed towards the use of computers in accounting education. The expanding use of computers in business has resulted in very significant changes in the accounting environment and has made it imperative that accounting educators expose their students to the computer. While there is agreement for the need to provide students with the computer skills necessary to prepare them for life in an emerging technological society, computer use in education is not widespread as it is not without its problems. Many factors impinge on the use of computers in education with the result that generally differences exist between the formulation of an educational objective and the achievement of that objective in practice.

The literature review focuses on current trends in this direction. As such it looks at the rationale for computer education in general and the effect on accounting education in particular. Within the literature review, many references have been made to the United States. It must be pointed out that the literature search covered countries other than America and that the predominance of reference to the United States is merely a function of the availability of literature based on the American experience rather than the greater relevance of the United States material.

2.1 RATIONALE FOR COMPUTER EDUCATION

Less than a decade ago, the use of computers in schools and classrooms was just a dream in the minds of forward looking educators. Today, computers are fast becoming an accepted part of school life. Many have argued that the computer is simply the latest in a series of instructional fads that will fade gradually into obscurity (Maddux, 1986; Wagschal, 1984; Whiteside & James, 1986) and it is true that educators have witnessed the demise of a series of ultimate solutions to educational problems. Given the nature of schools and their historical inability to change, it is not surprising, therefore, that Cuban (1986, p. 1) questions, "why should computers stand any better chance of becoming an integral part of teaching and learning than previous innovations?".

Perhaps the most telling reason is that computers have permeated virtually all aspects of society. Whereas in 1977 the prediction was that the future of computers looked very promising, today there is almost nothing that is not controlled by computers. For schools the message is clearly one of investment in computer technology. (Hannafin et al, 1987, p. 8).

A more important reason, however, is that the increased pressure to orient students to the technological society comes from beyond educational circles. In the United States

for example, it has been recognized that to survive in the face of intensifying international competition, accelerating technological change, oppressive public and private debt and the changes in the structure of the population and the work force, the learning enterprise must become more productive. According to Perelman (1988, p. 20), when an economy is knowledge based, learning becomes a strategically critical industry. Perelman believes that the educational system in the United States is at a crossroads. A continuation of the present policy will lead to an increasingly troubled future for both education and the economy, whereas a commitment to reforming education and restructuring technology will ensure the United States continues its international leadership role in the world of the 21st century. As Mecklenburger (1988, p. 18) says, "the old must embrace the new if society is to meet the unprecedented educational demands".

When the global effects of the technological revolution are considered, there is little doubt that electronic learning is the new technology of education. Since the computer has permeated circles far wider than educational ones, the need for educational reform has wider connotations which, perhaps is why, as a new method of instruction, the computer has a better chance of success than other previous innovations.

Computer education as an educational objective emerged in the late 1960's when it became clear that computers were having an increasing impact on society and the individuals within it and that citizens of the future would need to be able to cope with this impact. In his book Future Shock, Toffler (1970), described the accelerating speed of social and technological change and speculated that if the rate of change continued, it would produce a shock effect that some people would not be able to overcome. Within educational circles, therefore, computer literacy became one of the main aims of education. In addition to being literate in the traditional skills of reading, writing and arithmetic, it was considered that an individual should also possess a minimum level of skill in computer use. Computer literacy was considered the path to progress and, as a result, millions of dollars were set aside for computer literacy projects. (Shivasamy, 1987, p. 37).

In Western Australia it was recognized that individuals would need to have a realistic understanding of both the capabilities and limitations of computers, and be able to accommodate to changes that computers would cause in the nature of their work. A policy from the Director-General's office declared that "it is for this reason that the Education Department attaches priority to the provision of computer education programmes for all students". ("Computing in," 1981, p. 17).

2.2 PROVISION OF COMPUTERS IN EDUCATION

The provision of computers in education is best shown by Larson (1984, p. 61) who cites that in the United States the availability of computers for instructional use in schools increased from about 13 per cent in 1969 to about 35 per cent in 1982. A more recent survey reports a dramatic rise in computers in schools and predicts a national K-12 ratio of 1 computer to 25 students, or roughly one computer per classroom. (Quality Education Data, 1986).

In Western Australia the Education Department focussed its efforts prior to 1981 in Years 8-10. With 80 high schools and senior high schools and 60 district high schools the problems of acquiring and maintaining computer resources were considered huge. It was felt that to provide anywhere near the same level of support to the 500 or so primary schools would be impossible. The focus on Years 8-10 rather than Years 11-12 was justified by the fact that an estimated 50 per cent of students would leave school at the end of Year 10 or earlier and so a programme aimed mainly at Years 11-12 could not possibly provide for all students. In 1987 the situation was improved when the Ministry of Education, following the Beazley Report (1984) and the Better Schools Policy (1987), committed itself to provide an average of three computers to primary schools and one computer per 40 students to secondary schools. ("Computer plan," 1987).

The American experience shows that although computers are provided, they are not necessarily distributed uniformly as staff size, enrolment and urban location are also important determinants of computer availability. Large urban schools are more likely to have computers for instructional use than are small schools or schools in rural areas. This problem is not directly translatable to Western Australia where the provision of resources has been the domain of the State Education Department rather than School Boards even though prior to 1987, the provision of computing resources depended very much on the generosity of school Parents and Citizens Associations and varied greatly from one socio-economic area to another.

2.21 Accessibility to Computers in Schools

Simply having computers available is not enough. Their location in the school must be considered also as it tends to control the access time (or lack of it) for students. Where computers are not housed in faculty areas, access to them is often reduced. Generally, however, the problem of accessibility is one of number rather than of location. Not enough computers and too many students! It is suggested by Terry (1987, p.24), that as resources are often limited it is not accessibility that is paramount but rather the use that is made of the equipment. Only an ideal situation lets all students have access to computers at the same time!

2.22 Types of Computers Provided For Instructional Use

The types of computer provided for instructional use may also affect accessibility. According to the literature, schools select certain brands for various reasons. In the United States, for example, computer selection in the state of Ohio is predominantly the Apple. The popularity of the Apple is due fundamentally to the cost, the availability of equipment and vendor aggressiveness as regards sales and services. (Harmon, 1986, p. 246). This would suggest that when considering the type of computer to be provided, the adaptability of the computer to relevant applications is not necessarily paramount.

In Western Australia, schools had little choice in computer selection prior to 1987. It was part of Departmental policy to standardize hardware in order to be able to provide (free of charge) full maintenance and software support to schools with approved equipment. Those schools who chose hardware other than that recommended by the Education Department had to be prepared to foot all costs themselves. The hardware chosen by the Education Department at the time considered general computing ability only. Suitability to Accounting was not a consideration in the provision of the Microbee.

As of 1987, schools have been able to choose their own computer systems from a list of six or seven suggested by the Ministry. In compiling this list, the Ministry chose computers "not so much because of their technical qualities but because of their capacity to do the educational things required of them". ("Computer plans," 1987, p. 3). It has, however, been suggested that price was also an important factor in the compilation of these lists.

It would seem, therefore, that the provision of computers in education is on its own not enough to ensure the development of computer literacy. Accessibility depends not only on how many computers have been provided, but also on whether they have been distributed equitably, where they are housed and whether they lend themselves to the desired applications.

2.3 COMPUTERS IN ACCOUNTING EDUCATION

The vocational rationale for the promotion of computers in accounting was simply the fact that it was the accounting profession itself that was calling for accounting students to be trained in computer use. (Parmley & Parmley, 1987; Simmons & Hart, 1988). Computer technology had changed the way accounting was performed. Although the basic principles remained the same, the computer was replacing many of the hand operations of accounting with the result that the role of the accountant was changing from a passive record-keeping function to an active decision-making function. To retain a dominant position in the area of financial management, the accountant had to be the best user of information and for this to happen computer skills were necessary. If computer skills were needed by accountants, it followed that students in accounting courses needed to gain a basic understanding of computers. This would not happen unless the traditional objectives of the curriculum were expanded.

At the College level, by 1970, both the American Accounting Association (AAA, 1970) and the American Institute of Certified Public Accountants (AICPA, 1986) recognized the impact that technological advances in computers were having on the accounting profession and recommended that computer usage be integrated into accounting education. Faculty in the more progressive business schools had already designed

programmes to reflect technological advances (Romney, 1983, p. 11). With the availability of federal and corporate money, computer labs soon proliferated on most campuses and accounting curriculum was revised to include computer usage. (Shafer, 1987, p. 7). By 1986, the standards requirements of the American Assembly of Collegiate Schools of Business were based on integrated computer accounting applications as part of the accounting curriculum. (AACSB, 1986, p. 44).

Within Western Australia the Secondary Education Authority (SEA) which controls syllabus requirements in Year 11 and 12 introduced computer usage in accounting by making electronic data processing a part of the Accounting syllabus. The Year 11 syllabus specified the use of electronic data processing at an elementary level to 10% of the total course weighting. In Year 12 this was to be 5% of the total course weighting. In 1989 the syllabi were altered. Computer use in data processing still appeared in the Year 11 syllabus but the course weighting was reduced to 5%. The Year 12 syllabus required only that teachers raise students' awareness of the computer to process financial transactions and no allowance was made in the Assessment Structure for computer use. No reasons for the alterations to the syllabi were given. It was felt that many schools were possibly not satisfying the requirements for computer use and this was why there was a change in policy.

Although the value of using computers in accounting education is not disputed (Dickens & Harper, 1986), and although the literature suggests that a significant number of accounting courses are using computers for instructional purposes (Parmley & Parmley, 1987; Simmons & Hart, 1988), it is difficult to find evidence of specific cases.

Within the United States, studies at the University level by Simmons and Hart in 1984 (1988, p. 164) and Parmley and Parmley in 1986 (1987, p. 89) indicate increasing computer use in accounting courses. Of the 79 respondents to the 1984 study, 64 (81%) indicated that computers were currently being used in accounting education. A similar study in 1986 shows that the response rate increased by 14 per cent. At the secondary level, Holder (1984, p. 311) reports only a small percentage of computer usage in accounting although computer assisted instruction appears to be most popular.

Within Western Australia, there has been no survey relating to the extent of computer usage in Accounting education and, therefore, there is no evidence in literature to indicate whether or not any use of the computer is made within the Accounting curriculum.

2.31 Types of Computers Provided in Accounting Education

The types of computers provided in accounting education is generally a reflection of what is happening in the market place. The trend is the proliferation of the smaller, less costly personal computer with the result that the number of computers in accounting education is rising steadily. (Bialaszewski et al, 1986; Brooker, 1987).

At the same time there has been a swing from one brand of computer to another. In the United States, for example, the swing is away from the Apple towards the IBM. (Bialaszewski et al, 1986; Brooker, 1987; Hildebeitel & Harmon, 1984; Simmons & Hart, 1988; Shorter & Edmiston, 1988). Brooker (1987, p.358) reports that "the number of schools that use Apple decreased by 22 per cent and the average number that use IBM increased by 38 per cent". Undoubtedly this trend is due to the development of the less costly IBM personal computer but hardware on its own is necessarily not enough. It is in the development of the software for these personal computers that the attraction lies for the key to success in computer use is software. This may explain why the Ministry of Education in Western Australia has recently moved from providing the Microbee to providing the Nimrod in an effort to choose computers for their capacity to do the educational things required of them rather than for their technical qualities.

2.32 Software Available for Accounting Education

Traditionally, one limitation to computer use was quality software available for application purposes. Initially the software market was dominated by cottage industry software of inferior quality which provided only sketchy coverage for instructional needs. (Bork, 1986; Komoski, 1984). Komoski cites (p. 247) that "only 5 per cent of the hundreds of educational software programs have been judged of truly high quality while more than half have been judged not worth recommending". This is supported by a statement issued from the Director-General's office in Western Australia in 1980 acknowledging that some of the software available on the market was educationally unsound or technically inadequate.

In recent years software quality has improved. (Parmley & Parmley, 1987; Simmons & Hart, 1988). This is certainly true of accounting software in Western Australia where teachers have only recently had a choice of quality software for use in Accounting.

Another limitation on software has been quantity resulting from the fact that previously software written for one computer was not necessarily compatible with another. A direct result of the development of the personal computer was the move towards compatible software irrespective of the brand of computer used. Not only was software compatible,

it was also designed for ease of implementation in that its use did not depend on a high level of computer expertise. Thus the time required to introduce computers into the curriculum was reduced and, as a result, computer use was increased. (Lightner & Hartman, 1985, p. 15). On the local scene, although compatible software has also been the trend, there is no evidence of it resulting in increased computer usage.

The latest development in the software market has been to involve text book publishers in the manufacture of software. With the increasing commitment of schools to computer usage, instructional software has become potentially profitable and so manufacturers of text books have become "increasingly aware of the need to widen their scope from the conventional print-based materials to educational software". (Hannafin et al, 1987, p. 10). An example of this trend in Australia is the development of an accounting package by Kirkwood et al (1984) entitled Computer Accounting which can be used with their text book Accounting: An Introductory Perspective. The text book itself includes computer applications at the end of each chapter to enable computer of accounting to be easily incorporated into the study of the subject.

2.33 Software Applications in the Accounting Curriculum

Software applications within the accounting curriculum generally involve the use of simulations, spreadsheets and ledger packages.

Simulations are sophisticated programmes which attempt to recreate reality and make students live through a real world experience without suffering the consequences of a real world mistake. The simulation presents a model of a certain environment and various scenarios requiring decisions to be made. The results are then reflected in accounting reports. Simulations can be integrated into traditional accounting courses with little difficulty and through them students gain business experiences not possible through print-based texts alone. One example of simulation software is the Executive Business Game through which students learn the economic realities that management must contend with daily. In Western Australia the use of simulations is most common in Small Business courses where every effort is made to simulate actual accounting practices while developing the needed decision-making skills using computer technology.

According to Avison (1987 p.109), businesses have found spreadsheet analysis to be the most useful application for computers and the electronic spreadsheet has sold more computers than any other package because it has such a wide

range of application. Support for the use of spreadsheets in accounting courses is widespread. (Bialaszewski et al, 1986; Brooker, 1987; Parmley & Parmley, 1987; Simmons & Hart, 1988; Shorter & Edmiston, 1988). Bialaszewski et al (1986, p. 33) cite a survey where 117 of 135 respondents employed spreadsheets in at least one accounting course. This finding is supported by Brooker (1987, p. 359) who reports that spreadsheets were used by 86 per cent of all schools surveyed in a national sample.

The benefit of using a spreadsheet in accounting education is through the time-saved performance calculations possible. The learning concept involved is highlighted by reducing the time between changing a relationship and seeing the results. It is in highlighting what will happen if certain elements affecting the business change in the future spreadsheets are most valuable. By answering the 'what-if?' questions the effects of possible changes, that could only traditionally be guessed at, can be tested and analysed thoroughly.

Rowley (1987, p. 24) considers that spreadsheets have a role to play in Year 11 and 12 Accounting in the following areas:

- 1 Keeping track of actual expenditure and receipts as the manual multi-column cash journals do but in a faster, more accurate way. This is most suitable in Year 11.

- 2 'What-if' situations are particularly relevant to Cash flow budgets and profit reports for as Rowley (1987, p. 24) says, "students can examine whether a loan repayment of \$Y per month can be met by the business or the effect a 10% increase in sales has on profit". This is highlighted instantly by the spreadsheet while at the same time, the value of the spreadsheet to the business is illustrated. The cash flow budget applies to both Year 11 and 12 while the budgeted profit report fits into the Year 12 Cash Budget topic.
- 3 The use of graphing facilities associated with the spreadsheet to produce suitable performance graphs for management use is most relevant to Year 12 Accounting which aims to develop skills in analysis and interpretation of given financial data.
- 4 The analysis of business performance through inbuilt ratio/percentage calculations also relevant to the Analysis and Interpretation topic in Year 12.

Rowley believes that students enjoy spreadsheets because it is computer work. Various spreadsheet programs including Appleworks, Multiplan, Visicalc and Spreadsheet Plus, are available to the Accounting teacher and most have the same basic format.

Another software application is ledger packages which allow students to become familiar with real work accounting while enhancing learning by removing the tedium of journal and account construction and input for every exercise. Shafer (1987, p. 7), believes that as every text book now includes computer practice sets in its instructional packages, the greatest use of computers in accounting classrooms could well be in ledger applications. According to Fordham and White (1987, p. 17), the text book exercises are ideal for computer input as "the very problem students have been doing manually can be put into the accounting software".

Kirkwood et al (1987) include a number of computer programs and descriptions of business applications throughout their text to help students understand the impact computers are having on accounting. It is intended that the programs be used to find the solutions to various exercises which were prepared manually in order to appreciate the many advantages gained by a business which uses computers. The programs apply to such topics as journals, depreciation, provision for doubtful debts, schedules of debtors or creditors, the preparation of trial balances and final reports and can be included in both the Year 11 and 12 accounting syllabi.

Accounting packages based on the complete accounting cycle are becoming more prolific. These accounting packages (including Computer Accounting produced by Kirkwood et al)

are particularly valuable in illustrating the speed and efficiency of electronic data processing while at the same time allowing students to revise accounting principles without spending time manually inputting for each exercise. According to Edwards (1987, p. 23), "in this way students should retain their basic skills but do not need them reinforced in every exercise." Some packages allow a profit and loss report and balance sheet to be generated following each transaction which is particularly valuable early in Year 11 when the basic accounting equation is being taught.

While the literature highlights the advantages of computer use in specific accounting topics relating to secondary school accounting courses, the accounting syllabi give little guidance to how these topics could be enhanced by computer use. Edwards (1987, p. 24) cites that none of the core topics in the HCS Accounting curriculum in Victorian schools deal with computer accounting and the same applies to the Accounting syllabi in Western Australian secondary schools, where computer usage is specified but not related to particular topics in the curriculum.

In relation to software applications, the most important question to be considered is what students will learn about accounting by using computer applications. No where does the literature suggest that the manual preparation of any part of the course should be replaced because, although the

mechanics of the data recording can be done automatically by the computer, few students will understand what accounting processes the machine has done. It is only when they labour through the manual tasks that relationships take on any meaning. This process is time-consuming but to bypass it will, according to Shafer (1987, p.8), produce a group of "computer-literate, but accounting-illiterate students" who will understand how to choose the proper menu selection number displayed on the screen but will not understand the fundamentals of the accounting cycle. Computer accounting merely allows the teacher to choose the optimal manual means necessary to achieve the desired learning outcome.

In summary it can be seen that Accounting institutions are not immune to the computer revolution. The necessity for computer literacy has been recognized and computers have been integrated into accounting courses. As computer prices decrease, as software becomes increasingly available, and as programs that do not require a high level of expertise on the part of the user are developed, it is reasonable to assume that computer use within accounting education will increase. Interestingly, while there is much support for computer use in accounting and software available for this to take place, Accounting syllabi in the secondary schools offer little guidance to specific areas in which computers have a role to play.

2.4 TEACHERS' ATTITUDES TOWARDS COMPUTERS

With all the emphasis on using computers in the classroom, Fordham and White (1987, p.16) believe many teachers feel that computers must be used, whereas others avoid them completely. Yet for any new innovation in education to succeed, confident and competent teachers are needed as only by utilizing proper instructional strategies can teachers ensure that any such innovation is successful. Teachers' attitudes must be considered in any promotion of computer usage in accounting because the success or otherwise of computer use is ultimately dependent on these attitudes.

At first, teachers frequently had a negative attitude to the use of computers. It was thought computers were so complex that ordinary teachers could not understand them. (Harmon, 1986, p. 342). Many also feared that they might be replaced by them which created a subconscious resistance to their installation in the classroom. (Hannafin et al, 1987; Hunter, 1984; Wagschal, 1984). Another concern was that students would miss important learning experiences if they relied too heavily on computer instruction. (Mathinos & Woodward, 1988, p. 469).

The literature reports that teachers' reactions to computers and their involvement with them appear to be becoming more positive. (Becker, 1986a, 1986b; Norris & Lumsden, 1986).

For this positive trend to continue, two important issues need to be addressed. These concern teacher-preparation for computer-based instruction and the problem of time for teachers to make use of the computer in the classroom.

2.41 Teacher Preparation For Computer-Based Instruction

The emphasis on hardware and software often obscures perhaps the most important variable affecting computer usage in education; that of teacher preparedness. (Hannafin et al, 1987; Harmon, 1984; Holder, 1984; Hopewell & Myklebust, 1984; Wagschal, 1984). To implement meaningful computer-based education, teachers must be adequately trained. Generally, those teachers who are less apprehensive about using computers are those who have received more training on them. According to Holder (1984, p. 312), teachers who have had computer training enjoy using them in teaching, whereas those who have had no training, feel uneasy and tense about using them in the classroom. Harmon (1986) supports this claim. According to Harmon (p. 343), "teachers who are less apprehensive about teaching with computers are those who have received more pre-service training on them". While most teacher training institutions provide some preparation in computer use for prospective teachers, Hannafin et al (1987, p. 11) believe that these institutions have merely added computers to education and teach about them rather than concentrating on their use in

teaching. Prospective teachers become aware of computers but fail to receive adequate preparation to integrate them in the classroom.

Moreover, with a technology such as the computer, simple one-shot training is not enough. Inservice programmes do attempt to expose teachers to computers but are generally not long enough to provide the depth of understanding needed to make full functional use of the computer possible.

In Western Australia the Education Department established the Schools Computing Centre at which inservice courses were to be provided for teachers. These courses were generally only intensive one day courses and often teachers attending them had no facilities in their own schools to enable them to exploit what they had learnt. With the Better Schools Policy (1987) and the demise of subject Superintendents this provision for inservice training was no longer available.

2.42 Time For Computer Usage In Education

Even with adequate and meaningful preparation to implement computer use in the classroom, there is still the problem of time. This problem relates to both students and teachers and includes time for students to use computers in an already over-crowded school day and time for teachers to plan curriculum which includes computer usage. As Mathinos

and Woodward (1989, p. 470) write "there hardly seems to be enough time in the day to cover the standard curriculum let alone squeeze in one more subject or one more duty".

The changes made to the Year 11 and 12 Accounting curriculum in Western Australia to incorporate computer use is a case in point in that computers were merely added to the syllabi. Teachers already felt that the accounting syllabi were too long and when the SEA revised them to include computer use this was seen as just one more area to cover and invariably if any topic was to be left out of an already overcrowded syllabi it would be electronic data processing.

Unfortunately, if computers are perceived as merely another responsibility for the teacher, they will never realize their educational potential. The goal of computer use in education is ultimately to replace or simplify functions, not just to add responsibility. Yet according to Mathinos and Woodward (1988, p. 470) it would appear that within the classroom, teachers are so burdened by the task of teaching that they have not stopped to investigate the potential of the new technology. Were they to do so, they might find that the use of computers, rather than taking more time, may actually save time!

The needs of the teacher are, therefore, synonymous with computer education. Opportunities must be made available for teachers to learn about the potential for computer use in the classroom as it is well-trained teachers with confidence in their ability to use computers who will use them positively and effectively. Teachers themselves must be prepared to invest the time required initially to achieve this.

2.5 IMPLICATIONS AND CONCLUSIONS

The pace at which computer technology has developed and continues to develop, and the impact it has made on business and everyday life, leaves no doubt that computer literacy is essential both to the productivity of the learning industry and the economic supremacy of the nation as a whole. As it has permeated virtually all aspects of society its influence cannot be ignored and there appears to be little question that a commitment to computerized education should be undertaken.

Computers in business have revolutionized the handling of many of the repetitive aspects of accounting. This has changed both the status and the role of the accountant with the result that accountants now need computer skills. As a consequence the traditional objectives of Accounting education have been expanded to allow for the integration of computers into the Accounting curriculum, the vocational rationale justified by the fact that employers expect accountants to have computer skills.

The literature suggests that there is increasing support for computers and their integration into the curriculum is becoming a reality. Within accounting education, computers appear to be well-entrenched and according to Simmons and Hart (1988, p. 167), "expansion is on-going". So although

the educational system is generally notorious for being impervious to change, it appears that the innovation of computer education will be successful.

Differences generally exist between an educational objective and achieving this objective in practice. So it is with computers in accounting education. In Western Australia reference to computer use within Business Education was included in the policy on computers in secondary schools issued by the Director-General's office in 1980. This was a general policy on computer use and no specific reference to Accounting education was made. No official update has been made to this policy since even though as a result of the recommendations of the Beazley Report (1984), the Ministry has endeavoured to provide students in schools with more access to computers.

A move to include computer use in Year 11 and 12 Accounting was made by the SEA but other than a broad statement of intent, Accounting teachers have received little specific guidance. Although the literature has shown that there are certainly topics in the Accounting course where computers have a role to play, no reference is made by the SEA to any specific areas in the Accounting syllabi. As a result the use of computers in the Accounting curriculum has developed on an 'ad hoc' basis being dependent on school computer policies and the initiative of individual teachers.

The literature shows that many factors impinge on computer use in accounting. According to Larson (1984, p. 60), "achieving the goal of universal computer literacy requires the integration of teachers, software, hardware, curricula and students, supported by planning, financial resources and administration".

Initially, computer education supposes the capability of providing a high degree of 'hands-on' access which requires a sufficient number of computers to be provided if computer usage is to be effective. While there is evidence in the literature of the increasing availability of computers, there is no clear indication of the extent of computer usage in Accounting courses at the secondary school level. In Western Australia there is no evidence at all of the extent of computer usage in Year 11 and 12 accounting courses. Moreover, it appears, that computer exposure has evolved very much along socio-economic lines with the result that a new literacy crisis could emerge; one tied inextricably to economic means. According to Hannafin et al (1987, p. 14), it is possible that "not only will Johnny not be able to read, but he will also not be able to log on".

One conclusion of the literature is that resources alone do not guarantee effective computer use. Unless resources are accessible the use that can be made of them is certainly limited but in accounting another more important factor is

whether the available resources are capable of the specific applications required of them. If the computer cannot run the available software or if the software has little application for the task in hand, then little use will be made of the resources. And no matter how many resources are available as Terry (1987, p. 23) says, "the co-ordination and scheduling of resources is paramount if the maximum use is to be made of the equipment".

Another more important conclusion of the literature is that any formulation of policy for computer use must consider the attitudes of those involved in computer education as it is these attitudes which will affect what is actually being done in the classroom. The current attitude in some schools appears to be that computers add to the burden of an already overburdened teacher and the implication is that if they are taught as yet another subject, the time allocated to other aspects of the teaching day will consequently be reduced. According to literature, there is no need to add computers to the curriculum. Rather they should be infused into the normal routines so that they support the curriculum not add to it.

For teachers to be fully prepared to utilize computers in this way factors such as time and inservice training must be considered. Yet in Western Australia at a time when the use of the computer is being encouraged, the coordination of

resources, software support and inservice training is no longer centrally controlled but dependent upon individual teachers or the computer policy of each school.

Any promotion of computer usage, therefore, must focus on all the factors necessary for effective computer use. Only then can the educational goal be applied in practice. An investment in computer education is not guaranteed merely by the supply of sufficient resources and vague directives from policy makers as the use made of computers in the classroom is ultimately a problem of human perception rather than technological capability.

3 DESIGN OF THE STUDY

- 3.1 Population Used for the Research
- 3.2 Data Collection Procedure
- 3.3 Ethical Considerations
- 3.4 Data Analysis Procedure

3 DESIGN OF THE STUDY

The objective of this research, based on the assumptions underlying it, was to describe systematically, factually and accurately, the characteristics of computer implementation within the Year 11 and 12 Accounting curriculum of Western Australian secondary government schools.

To determine the current situation a descriptive research design was used. As part of this design, the present situation was surveyed and interpreted in terms of all available facts. From this it was possible to identify problems or justify current practices which existed.

The survey method was chosen as it enabled the researcher to observe any given situation as it was, without the need to set up experimental conditions, using as it does the element of comparison to describe the situation as it exists. The use of the survey method was justified, firstly, because there appeared to be an absence on record at present of information about an educationally significant factor, and secondly, because the situation which could generate the information existed and was accessible to the researcher.

3.1 POPULATION USED FOR THE RESEARCH

The population in this research consisted of Accounting teachers in Western Australian secondary government schools. A select sample was taken from the population and the research results were generalized to the whole population. Care was taken to ensure that the sample had the same characteristics as the population so that results obtained from the sample could, within certain limits, be able to be generalized to the whole population

It was recognized that the value of the survey approach depends very much on how representative the chosen sample is of the whole population. Small scale studies restricted to one school or one area may give information of value to the specific school or area concerned but cannot be successfully generalized beyond the school or area. As all secondary schools in Western Australia which include Accounting in their course offerings in Year 11 and 12 are subject to the same SEA requirements and are covered by the same Ministry policies, it was considered that any sample chosen from among them should represent the whole population.

The sample population, therefore, consisted of Accounting teachers in all metropolitan government senior high schools.

3.2 DATA COLLECTION PROCEDURE

The survey took the form of a questionnaire, regarded by the researcher as an interview on paper. It consisted of a series of questions and statements to which teachers were asked to respond. The questions asked for facts, opinions, and preferences of the respondents. As the survey was a relatively simple and factual inquiry, the questionnaire was considered to be particularly reliable. The value of this type of data collection device is that it requires little time to administer and reaches a wide sample of the population.

3.21 Design of the Questionnaire

The questionnaire (**Appendix 1**) was designed to use "closed-form" items to improve the reliability and consistency of the data sought. The responses sought were facilitated by providing statements or questions to which a person was required to respond by selecting from a list of available alternatives. In some cases, a very short written response was required but generally the structured items were multi-choice in nature.

It was considered that scoring this questionnaire would be very objective and very efficient as the closed-form items facilitate the tabulation and analysis of data.

In some areas of the questionnaire more than one response could be applicable. The item format allowed for this by asking respondents to indicate all possible preferences.

Also included was a 'provide a comment' item format to elicit an unstructured response where necessary. It was not used often because it was felt that not only would it be more difficult to collate and analyse, it was also recognized that this format is seldom successful as people tend to ignore the invitation to comment. Nevertheless, by allowing respondents to formulate their own answers, there would be less danger of encouraging them towards selecting particular answers only, providing as it did for the respondents' own views. Moreover, it was felt that it might produce data which would clarify what respondents really thought about some matter. As the survey was an exploratory study in an area in which there is insufficient information available for an adequate range of alternatives to be formulated, the inclusion of this format was seen as beneficial.

The questionnaire consisted of eight pages and had four parts:

1. Part 1 clarified personal details of the Accounting teacher.
2. Part 2 examined administrative details of the school as they related to computing.
3. Part 3 highlighted details of computer availability at the school.
4. Part 4 looked at the use teachers were making of computers within the accounting curriculum at the school.

Each part of the questionnaire was designed to test specific variables. The variables and the questions which relate to each variable are summarized in Table 1.

**Table 1 Summary of Variables Relating to the
Questionnaire**

Part of Questionnaire	Variables Tested	Related Questions
Personal Details of the Accounting Teachers	- Qualifications - Teaching Experience - No. of Accounting Classes Taught	(1) (2)(3)(4) (5)
Administrative Details of the School	- Size - Teachers in Business Education - Accounting Classes - Accounting Teachers - Accounting Students	(6) (7) (8) (9) (10)
Computer Availability at the School	- Number of Computers - Number of Printers - Types of Computers - Computer Policy - Computer Location - Computer Usage	(11)(15) (17) (12)(16) (13)(14) (18) (19)
Use of Computers in Accounting	- Teacher Attitudes - Degree of Computer Usage - Area of Usage - Related Software - Perceived Benefits - Factors Impinging Use	(21)(22) (23)(24) (25)(26) (27) (28) (29) (30)(31)

3.22 Validation of the Questionnaire

Before the questionnaire was circulated it was field tested through informal testing of the questions with respondents like those used in the study. Those selected were told the purpose of the survey, and that they were being asked to test the draft questionnaire. The pilot run highlighted the time needed to complete the questionnaire. Fortunately for the researcher it did not show up any major flaws or ambiguities. There was, therefore, no necessity for a revised draft or a further re-test with a different group. Most importantly, the field test assessed the possibility of yielding the information desired.

3.23 Covering Letter to the Questionnaire

A covering letter (Appendix 2) was designed to accompany the questionnaire. This letter requested the prospective respondent's co-operation in completing and returning the instrument and contained a brief explanation of the purpose of the questionnaire. It also stressed the importance of the information requested and provided a guarantee that the identity of the respondent and the responses made would be held in strictest confidence. A return date was set for the completion of the questionnaire in order to dissuade any procrastination and a stamped addressed envelope was supplied to facilitate its return.

3.24 Follow-Up to the Questionnaire

To ensure at least a 70% response rate, the questionnaire was followed up with a second letter (**Appendix 3**). This was considered a very important step in the data collection process because it was recognized that a response rate of much less than 70% could result in the findings lacking validity for general application.

The response to the questionnaire was very slow with only a 50% response on the first mailing. The follow up to the questionnaire was, therefore, essential to this research as it was only after the follow up that the survey results were able to be analysed.

3.5 Survey Acknowledgement

A survey acknowledgement (**Appendix 4**) was despatched on receipt of the returned questionnaire thanking teachers for their consideration of the questionnaire and its return.

3.3 ETHICAL CONSIDERATIONS

It was recognized that the responsibility for privacy and confidentiality related directly to the researcher and, therefore, steps were taken to protect the privacy and confidentiality of all concerned. The mailed questionnaire was addressed to the Accounting teacher through the Principal. In this way the Principal was fully informed about the precise nature and purpose of the research from the outset and any consent for the participation of the school in the survey was able to be established or withheld advisedly.

Confidentiality was guaranteed in the nature of the survey itself. As the focus of the survey was merely a descriptive analysis of the current status of computer usage in schools, it was not necessary to the results of the survey to name teachers or schools or even locations. Therefore, the offer of anonymity, given in the covering letter was able to be made in all conscience and honoured.

Provision was made on the cover of the questionnaire for the name of the school. This was for administrative purposes only and was detached promptly when the questionnaire was returned. Teachers were assured in the covering letter that this identification was simply for follow-up procedures to ensure that an adequate response rate could be guaranteed.

3.4 DATA ANALYSIS PROCEDURE

The data analysis in this research is in the form of a descriptive analysis of results obtained, justified by the nature of the research itself. The results are presented in a series of tables and relate directly to the research questions. The tables show the frequency of occurrence of particular responses by indicating the percentage of respondents who selected each alternative for each item. As well as the response rate for each item, the total sample size and overall percentage of returns is shown.

In addition to simply determining choices, the survey results show the relationships between variables by comparing responses on one item with responses on other items. In this way it has been possible to determine some explanation for certain behaviours by identifying the factors that seem to be related to certain responses. It is recognized that this research does not enable the researcher to establish direct cause-effect but where one event is invariably followed by another it is considered that it may be inferred.

No attempt has been made to assign a numeric value to any response in the questionnaire. As the research is simply looking for a response, rather than a particular response, value responses are not considered necessary.

In order to access non-response bias, late responses have been compared to early responses as according to Oppenheim (1966), this procedure assumes that late respondents are similar to nonrespondents.

Coding was carried out by computer means and provision for this has been made in the questionnaire design. The Statistical Analysis System (SAS) programme was used for data manipulation and analysis. Frequency distributions were calculated for all significant relationships existing between different variables in the questionnaire and variables were analysed to identify those that cause significant differences in responses.

4 RESULTS OF THE SURVEY

- 4.1 Profile of Respondents
- 4.2 Profile of Schools
- 4.3 Availability of Computers
- 4.4 Current Extent of Computer Usage in Accounting
- 4.5 Instructional Software in Accounting Education
- 4.6 Teachers' Attitudes on Use of Computers in Accounting
- 4.7 Computer Usage Related to Size of School
- 4.8 Computer Usage Related to Teaching Experience
- 4.9 Computer Usage Related to Computer Brands
- 4.10 Respondents' Comments

4 RESULTS OF THE SURVEY

The questionnaire was sent to 53 metropolitan senior high schools which provide Accounting at Year 11 and 12 level. All respondents to the survey were Accounting teachers. Replies were received from 38 teachers, with two indicating that they did not want to be part of the survey for personal reasons. The 36 usable responses yielded a 68% response rate which provided information about the current nature and extent of computer usage within Accounting education.

4.1 PROFILE OF RESPONDENTS

One of the contentions of computer usage is often the unavailability of adequate personnel. Initially, therefore, the survey sought to establish a profile of teachers involved in Accounting education.

A summary of the demographic data of the respondents (presented in Table 2) shows that of those responding to the questionnaire, 33% hold a Bachelor of Education degree and 36% have either a Teachers' Certificate or a Diploma of Teaching. Only one-third of Accounting teachers, therefore, have graduate qualifications. The teaching qualifications of the remaining 22% include Accounting qualifications, namely a Diploma in Accounting, a Bachelor of Business or a Masters in Business.

Table 2 Demographic Profile of Respondents

	<u>Response</u>	<u>%</u>
Professional Certification		
Teachers' Certificate	2	5.6
Diploma of Teaching	11	30.6
Bachelor of Education	8	33.3
Other	<u>8</u>	<u>22.2</u>
	<u>36</u>	<u>100%</u>
Years of Experience		
1 - 6 years	9	25.0
7 - 12 years	16	44.4
13 - 20 years	10	27.8
over 20 years	<u>1</u>	<u>2.8</u>
	<u>36</u>	<u>100%</u>
Years Teaching Accounting		
1 - 6 years	18	50.0
7 - 12 years	13	36.1
13 - 19 years	<u>5</u>	<u>13.9</u>
	<u>36</u>	<u>100%</u>
Years at Present School		
1 - 3 years	22	61.1
4 - 6 years	10	27.8
7 - 9 years	<u>4</u>	<u>11.1</u>
	<u>36</u>	<u>100%</u>
Number of Classes Taught		
1 class	4	11.1
2 classes	20	55.6
3 classes	8	22.2
4 classes	<u>4</u>	<u>11.1</u>
	<u>36</u>	<u>100%</u>

The survey looked at teaching experience in general and accounting experience in particular. The data shows that, overall, 25% of Accounting teachers have been teaching for 6 years or less and 69% have been teaching for 12 years or less. Of note is the fact that of the teachers with 6 years or less experience, 50% are teaching Accounting. Only a very small percentage of Accounting teachers (14% of the total), therefore, are experienced teachers with more than 12 years' teaching experience in Accounting.

Interestingly enough, only a small percentage of teachers (11%) have been teaching Accounting at their present school for more than six years with one-third of all teachers (11 respondents) indicating that they have been at their present school for only one year. The survey data indicates also that over half of the respondents (55%) teach at least two Accounting classes.

4.2 PROFILE OF SCHOOLS

The schools selected for the survey, although all senior high schools, varied in size of average enrolment. One purpose of the questionnaire was to determine whether size resulted in great discrepancies between schools in relation to computer usage. Table 3 presents a summary of the demographic profile of schools.

Table 3 Demographic Profile of Schools

Size of School	No		%	
over 1000 students	1		2.8	
between 800-1000 students	15		41.7	
between 500-800 students	11		30.6	
less than 500 students	<u>9</u>		<u>25.0</u>	
	<u>36</u>		<u>100%</u>	
No. of Business Teachers	Full-time		Part-time	
0	2	5.6	14	38.9
1	5	13.9	17	47.2
2	16	44.4	4	11.1
3	6	16.7	-	-
4	5	13.9	-	-
5	2	5.6	-	-
6	<u>-</u>	<u>-</u>	<u>1</u>	<u>2.8</u>
	<u>36</u>	<u>100%</u>	<u>36</u>	<u>100%</u>
No. of Accounting Teachers	Year 11		Year 12	
0	-	-	1	2.8
1	23	63.9	27	75.0
2	<u>13</u>	<u>36.1</u>	<u>8</u>	<u>22.2</u>
	<u>36</u>	<u>100%</u>	<u>36</u>	<u>100%</u>
No. of Accounting Classes	Year 11		Year 12	
0	-	-	1	2.8
1	16	44.4	17	47.2
2	16	44.4	15	47.7
3	<u>4</u>	<u>11.1</u>	<u>3</u>	<u>8.3</u>
	<u>36</u>	<u>100%</u>	<u>36</u>	<u>100%</u>
No. of Students in Class	Year 11		Year 12	
0-12	1	2.8	6	16.7
13-20	11	30.5	22	61.1
21-25	18	50.0	8	22.2
26-28	<u>6</u>	<u>16.7</u>	<u>-</u>	<u>-</u>
	<u>36</u>	<u>100%</u>	<u>36</u>	<u>100%</u>

The survey data shows that 42% of responding schools have between 800-1000 students and 31% have between 500-800. Only one response indicated a school size of over 1000 students. Almost three-quarters of all schools, therefore, have an average enrolment of no less than 500 and no more than 1000 students.

Within the Business Faculty, 81% of respondents indicated that there are three or less full-time teachers and nearly half indicated that there is at least one part-time teacher on staff. Two-thirds (64%) of Business Education teachers teach at least one class of Accounting in Year 11 and a little over one-third (36%) teach two. In Year 12, three-quarters (75%) of teachers have only one Accounting class while less than one-quarter (22%) have two.

The number of Accounting classes at the school appears to be constant from Year 11 to Year 12 although one respondent reports no classes in Year 12. The data shows that in both Year 11 and Year 12, approximately 90% of all schools have between one and two classes at each year level.

On average, the number of students in a class appears to be 25 or less in Year 11 (indicated by 84% of respondents). In Year 12, 83% of responses report a maximum number of 25 or less students with two-thirds of the responses indicating between 13-20 students.

4.3 AVAILABILITY OF COMPUTERS

One of the main purposes of the research was to determine the availability of computers in the school as it is considered that computer usage in Accounting is dependent on a viable number of computers being available for this purpose. To determine computer facilities, consideration was given to both the number and brand of computers owned.

Table 4 summarizes teachers' responses to the number and brands of computers available for student use both in the school and in the Business Education Faculty.

A little over one-third of the respondents (39%) indicated the availability of up to 20 computers for instructional use. This number did not include administrative computers. Almost another 40% had up to 40 computers and, surprisingly, 18% indicated the availability of more than 50 computers.

Within Business Education the ratio of students to computers is not as favourable with 58% of respondents indicating only two or less computers and 31% reporting no computers within the faculty. Only a quarter of those responding to the survey have more than three computers available for student use. The survey did not provide for responses to any general access to computers in the school if not available in Business Education.

Table 4 Number and Brands of Computers Available

<u>No. of Computers</u>	<u>In the School</u>		<u>In Business Education</u>	
	<u>No</u>	<u>%</u>	<u>No</u>	<u>%</u>
0	-	-	11	30.6
1 - 2	-	-	8	22.2
3 - 10	4	12.1	9	25.0
11 - 20	9	27.2	2	5.6
21 - 30	5	15.2	2	5.6
31 - 40	9	27.2	2	5.6
41 - 50	4	12.1	-	-
over 51	<u>2</u>	<u>6.1</u>	-	-
	<u>33*</u>	<u>100%</u>	<u>36</u>	<u>100%</u>

<u>Computer Brands</u>	<u>In the School</u>		<u>In Business Education</u>	
	<u>No</u>	<u>%</u>	<u>No</u>	<u>%</u>
Microbee	20	33.3	14	45.2
Nimrod	32	53.3	14	45.2
IBM	1	1.6	1	3.2
Apple	1	1.6	-	-
IBM Compatible	4	6.7	2	6.4
Acorn	1	1.6	-	-
Commodore 64	-	-	-	-
Other	<u>1</u>	<u>1.6</u>	<u>-</u>	<u>-</u>
	<u>60**</u>	<u>100%</u>	<u>31**</u>	<u>100%</u>

* Three responses missing

** Some respondents indicated the availability of more than one brand of computer

The survey shows that the brand of computer being used in schools is predominantly the Nimrod (an IBM compatible). As shown in Table 4, the availability of the Nimrod is reported in 53.3% of cases with the Microbee being available in 38.3% of schools. Within Business Education 45.2% of respondents indicate the availability of both of these computer brands.

To determine computer availability at the school the survey also considered the accessibility of computers within Business Education. To the question of how computers are housed within the faculty, 96% of responses report that computers are located in one central area and even when they are spread throughout the faculty, there are at least 20 machines located in any one place. It would seem that accessibility to computers is not a problem although accessibility to printers could be a problem. Over 60% of respondents indicate the availability of no more than two printers within Business Education.

In relation to computer availability, the survey examined also whether schools had an overall computer policy and who administered the policy. Approximately 40% of those who indicated a computer policy in the school reported that it was coordinated by the Maths/Computing Department. Within Business Education, however, computer use is dependent not on school policy but on Business Education policy as indicated by 67% of respondents.

4.4 CURRENT EXTENT OF COMPUTER USAGE IN ACCOUNTING

From the results of this survey it would appear that those who have access to computer equipment are using it in a variety of ways. Classroom use of the computer is divided into four general areas as shown in Table 5. Of the four areas, Word Processing appears to be the most popular with 73% (19 responses) reporting its use. Typewriting comes a very close second with 65% of respondents indicating that computers are used for this purpose. Of significance is the fact that to the question of whether or not the computer is being used in Accounting, more than half of the respondents (56%) answered in the negative.

Table 6 provides a summary of the use that is being made of the computer in Accounting education. It is based on the responses of the 16 teachers who indicated that they used the computer within the Accounting curriculum.

Over half of the respondents (56%) indicated that the computer was being used at Year 11 level whereas only 6% reported its use in Year 12. Although 39% of respondents used the computer in both Year 11 and 12, there is no indication of the time spent on the computer within each Year.

Table 5 Classroom Use of the Computer

Area of Use	<u>Response</u>			<u>%</u>		
	Yes	No	Total	Yes	No	Total
Typewriting	18	8	26	69.2	30.8	100%
Word Processing	19	7	26	73.1	26.9	100%
Data Processing	12	10	22	54.5	45.5	100%
Accounting	16	20	36	44.4	55.6	100%
Other	8	9	17	47.1	52.9	100%

* Total responses do not sum 36 since some respondents indicated that more than one use was being made of the computer in the classroom

Table 6 Summary of Computer Usage in Accounting

Curriculum Level Used	No	%
Year 11 only	10	55.6
Year 12 only	1	5.6
Year 11 and 12	<u>7</u>	<u>38.8</u>
	18*	100%

Time Weighting Given	Year 11	Year 12
1 ~ 5%	11 68.8	7 43.8
5 ~ 10%	4 25.0	- -
more than 10%	<u>1</u> <u>6.2</u>	<u>-</u> <u>-</u>
	16 100%	7** 100%

Frequency of Use	No	%
Weekly	1	6.7
Certain Topics Only ¹	<u>14</u>	<u>93.3</u>
	15***	100%

Certain Topics Only ¹	No	%
Introduction to Computing	1	5.3
Basic Record Keeping	14	73.6
Revisionary Purposes	2	10.5
Spreadsheet Analysis	1	5.3
Introduction of Topic	<u>1</u>	<u>5.3</u>
	19*	100%

Computer Activities	No	%
Revision	7	14.3
Business Simulations	7	25.0
Spreadsheets	8	25.0
Ledger Applications	<u>2</u>	<u>7.1</u>
Other	28*	100%

* Some respondents indicated more than one level

** Indicated at Year 12 level by some respondents only

*** Does not include response indicating 'unstructured use'

On the question of time spent on computer applications, the survey data shows that over two-thirds of teachers devote no more than 5% of the total time in Year 11 to computer usage, one quarter devote up to 10% of the total time and only a very small percentage (6%) use more than 10% of the total time available for this purpose.

In Year 12 no more than 5% of time is spent on computer use. Moreover, those students who use the computer in Accounting do not use it on a regular basis. Rather, computer use is related to certain topics only. This was indicated by over 90% of the 15 respondents to this statement with one showing a totally unstructured use of the computer, preferring to use it "as the need arose".

The most popular use for the computer in Accounting appears to be related to the basic record keeping topic as indicated by 73.6% of the respondents. Specific computer activities include ledger applications (28.6%), spreadsheets (25%), business simulations (25%) and revision exercises (14.3%) all of which encompass basic record keeping.

4.5 INSTRUCTIONAL SOFTWARE IN ACCOUNTING EDUCATION

In relation to instructional software, the survey data shows that the software packages most often used by schools are educational packages based on current accounting text books distributed by text book publishers rather than commercial accounting systems. As can be seen from Table 7, these educational accounting packages make up over 50% of the total responses.

Table 7 Instructional Software in Accounting Education

Software Package	No	%
First Choice	2	9.5
Jay's Enterprise	2	9.5
Sybiz	1	4.8
Computer Accounting (Kirkwood)	8	38.1
Spreadsheets	2	9.5
Computer Accounting (VCTA)	4	19.0
Ausparts	1	4.8
Multiplan	1	4.8
	21*	100%

* Some respondents used more than one software package

4.6 TEACHERS' ATTITUDES ON USE OF COMPUTERS IN ACCOUNTING

When presented with statements on attitudes towards computer use in Accounting, teachers provided some interesting data. A summary of responses to attitudinal questions on the use of computers in Accounting is given in Table 8.

Only a little over half (53%) of the respondents reported that they were comfortable with using computers and 47% of them agreed that the 'hands on' use of computers in Accounting was important (some indicating very important). A small percentage (14%) surprisingly indicated that the 'hands on' use of computers in Accounting education was actually of little importance.

Where computers were not being used, time constraints was reported as the key factor in preventing the successful utilization of computers within Accounting education. Over 30% of responses indicated that computer use would be easier if more time were available. Closely related to the issue of time was the belief that more inservice training would result in greater computer utilization with 22 respondents (31%) answering this statement in the positive. Contrary to popular belief, the availability of hardware and software were not chosen as the key factors in preventing greater computer use within Accounting.

Table 8 Responses to Attitudinal Questions On Use Of Computers in Accounting

	No	%
Are you comfortable with using computers?	19	52.8
Are you apprehensive about using computers?	<u>17</u> <u>36</u>	<u>47.2</u> <u>100%</u>
‘Hands on’ use of computers is:		
very important?	17	47.2
important?	10	27.8
moderately important?	4	11.1
of little importance?	<u>5</u> <u>36</u>	<u>13.9</u> <u>100%</u>
I am prevented from utilizing computers more frequently due to:		
availability of hardware?	12	17.0
accessibility to hardware?	12	17.0
availability of software?	14	19.0
time constraints?	26	36.0
lack of computer knowledge?	<u>8</u> <u>72*</u>	<u>11.0</u> <u>100%</u>
Computer use would be easier with:		
more time?	24	34.3
more in-service training?	22	31.4
accessibility to computers?	17	24.3
being able to take a computer home?	<u>7</u> <u>70*</u>	<u>10.0</u> <u>100%</u>
Perceived benefits of computer use:		
problem solving?	8	17.8
individualized instruction?	9	20.0
computer literacy?	12	26.7
reinforcing basic concepts?	15	33.3
other?	<u>1</u> <u>45*</u>	<u>2.2</u> <u>100%</u>

* Some respondents indicated more than one choice

4.7 COMPUTER USAGE RELATED TO SIZE OF SCHOOL

In addition to determining what use was being made of computers in Accounting education in the individual schools, the study sought to test whether computer usage was related to school size.

Firstly, a comparison was made between the size of the school and the computer facilities available to determine if a significant relationship existed between school size and computer availability. As can be seen from **Table 9**, based on a four-way stratification by enrolment size, no school of over 1 000 students indicated computer facilities in the school. However, as there were three responses missing to this statement it is uncertain if the finding is true. Schools with an enrolment of between 800-1000 students reported the availability of an average of 32 computers as compared to 34 in schools with a student enrolment of between 500-800. Schools with an average enrolment of between 500-800 make up 76% of all schools surveyed. Of significance is the fact that schools with less than 500 students have only an average of 16 computers for student use.

**Table 9 Summary of Computer Availability Based on
Stratification of School Size by Enrolment**

<u>School Size</u>	<u>Computers Available in the School</u>					
	<u>No</u>	<u>%</u>	<u>Total</u>	<u>X</u>	<u>Lowest No</u>	<u>Highest No</u>
over 1000 students	-	-	-	-	-	-
800 - 1000 students	14	42.4	449	32	9	56
500 - 800 students	11	33.4	378	34	3	50
below 500 students	8	24.2	128	16	5	30
	<u>33*</u>	<u>100%</u>				

<u>School Size</u>	<u>Computers Available in Business</u>					
	<u>No</u>	<u>%</u>	<u>Total</u>	<u>X</u>	<u>Lowest No</u>	<u>Highest No</u>
over 1000 students	1	2.8	1	1	1	1
800 - 1000 students	15	41.7	92	6	1	31
500 - 800 students	11	3.5	104	9	1	40
below 500 students	9	25.0	36	4	1	20
	<u>36</u>	<u>100%</u>				

* Three responses missing

Within Business Education, the average number of computers available for student use is surprisingly greater in schools with an enrolment of between 500-800 students than in schools with an enrolment of between 800-1000. Not only is the average number of computers higher but so also is the maximum number of computers available.

A second comparison related to computers in schools was made to determine whether there is a significant relationship between the number of computers available in the school and the use that is being made of them in the Accounting curriculum. The question posed was whether teachers who have more facilities available to them actually make more use of them.

The summary of results presented in Table 10 shows that based on 33 out of 36 respondents to this question, approximately 70% of schools have between 11 and 40 computers available for student use. Of these respondents, nine (27%) indicate that the computer is being used in Accounting and fourteen (42%) indicate that it is not. It could be assumed, therefore, that computer facilities alone are no guarantee of the use that is made of the computer in Accounting education.

Table 10 Summary of Computer Usage in Accounting in
Relation to Computer Availability in the School

<u>No. of Computers</u> <u>in the School</u>	<u>Use of Computers in Accounting</u>					
	<u>Yes</u>		<u>No</u>		<u>Total</u>	
	<u>No</u>	<u>%</u>	<u>No</u>	<u>%</u>	<u>No</u>	<u>%</u>
3 - 10	2	6.1	2	6.1	4	12.2
11 - 20	3	9.1	6	18.2	9	27.3
25 - 40	6	18.2	8	24.2	14	42.4
45 - 56	<u>3</u>	<u>9.1</u>	<u>3</u>	<u>9.1</u>	<u>6</u>	<u>18.2</u>
	<u>14</u>	<u>42.5</u>	<u>19</u>	<u>57.6</u>	<u>*33</u>	<u>100%</u>

* Three responses missing

4.8 COMPUTER USAGE RELATED TO TEACHING EXPERIENCE

One of the purposes of the survey was to determine whether recent graduates' emphasis on computer education differs from that of earlier graduates. Accordingly, the survey data was analysed to test what proportion of the teachers who responded positively to using computers in Accounting were beginning teachers (with 6 or less years of teaching experience) and what proportion were experienced teachers (with up to and more than 12 years of teaching experience in Accounting).

The results shown in Table 11 indicate that recent graduates make little use of computers in Accounting. Of the 25% of respondents who indicated that they had between 1-6 years teaching experience, only one-third made use of computers in Accounting. Interestingly enough, the percentage of experienced teachers who used computers was equal to the percentage of those who did not.

The literature indicates that computer use in Accounting would be facilitated by more inservice training and almost one-third of teachers in this survey agreed with this. A further analysis of the survey results was now made to determine whether the need for more inservice training was indicated by experienced teachers or by beginning teachers.

Table 11 Comparison Between Computer Usage in Accounting
And Years of Teaching Experience

<u>Years of Teaching Experience</u>	<u>Use of Computers in Accounting</u>					
	<u>Yes</u>		<u>No</u>		<u>Total</u>	
	<u>No</u>	<u>%</u>	<u>No</u>	<u>%</u>	<u>No</u>	<u>%</u>
1 - 6 years	3	8.3	6	16.7	9	25.0
7 - 12 years	8	22.2	8	22.2	16	44.4
13 - 20 years	5	13.9	5	13.9	10	27.8
over 20 years	<u>0</u>	<u>-</u>	<u>1</u>	<u>2.8</u>	<u>1</u>	<u>2.8</u>
	16	44.4	20	55.6	36	100%

The summary of this analysis is presented in Table 12 and shows that the need for more inservice training had been indicated by over half (56.5%) of the respondents. This represented over a third of the total responses and was made up of teachers who had no more than 6 years of teaching experience. Interestingly enough, the choice of this response decreased in proportion to the increase in the years of teaching experience.

Another factor relating to computer use in Accounting is the problem of time. Of the total respondents in this survey who indicated that they did not use computers, one-third gave time as the predominant reason for not doing so. The same analysis was applied to the problem of time to test whether there is any correlation between this factor and the years of teaching experience.

Table 13 is a summary of the comparison between the two variables. The data shows that it is experienced teachers (those teaching between 7-19 years) who responded that more time would facilitate computer usage. Two-thirds of the respondents (almost a quarter of the total responses) answered this statement positively. Unfortunately, there is no indication as to whether the extra time would be used for teacher preparation for computer use in Accounting or whether the extra time is needed in order to fit computer use into the curriculum.

**Table 12 Comparison Between Teaching Experience
in Accounting and the Need for Inservice Training Based on
the Responses of Those Who Use Computers in Accounting**

<u>Teaching Experience in Accounting</u>	<u>Need for Greater Inservice Training</u>		<u>% of Total Responses (n = 36)</u>
	<u>No</u>	<u>Yes</u> <u>%</u>	
1 - 6 years	13	56.5	36.1
7 - 12 years	7	30.4	19.4
13 - 19 years	<u>3</u>	<u>12.0</u>	<u>8.3</u>
	<u>23</u>	<u>100%</u>	<u>63.8</u>

**Table 13 Comparison Between Teaching Experience
in Accounting and the Need For More Time Based on the
Responses of Those Who Do Not Use Computers in Accounting**

<u>Teaching Experience in Accounting</u>	<u>Need For More Time*</u>		<u>% of Total Responses (n = 36)</u>
	<u>No</u>	<u>Yes</u> <u>%</u>	
1 - 6 years	4	33.3	11.1
7 - 12 years	6	50.0	16.7
13 - 19 years	<u>2</u>	<u>16.7</u>	<u>5.6</u>
	<u>12</u>	<u>100%</u>	<u>33.3</u>

* No indication if more time for preparation or more time for computer use within the Accounting curriculum.

4.9 COMPUTER USAGE RELATED TO COMPUTER BRANDS

According to literature, the type of computer provided affects the use that can be made of it in Accounting. Results of the survey indicate that the most popular brands of computers in schools are Nimrods and Microbees. It has been established that the availability of the Microbee is related not to its adaptability for use in Accounting but rather to Departmental policy to standardize hardware in the schools. The Nimrod, on the other hand, is much more capable of adaptation to Accounting being a more powerful and sophisticated computer system. It could be assumed from this that schools having access to Nimrods would be more likely to use computers in the Accounting curriculum.

An analysis of results was, therefore, made to determine if the brand of computer in the school had any relationship to the use being made of it in Accounting. As can be seen from **Table 14**, the use of computers in Accounting does not appear to depend on the brand of computer. Where both negative or positive response were given, the same number of Nimrods and Microbees were available in the schools. It would appear, therefore, that in Western Australia other factors apart from computer brands impinge on computer use in Accounting. The survey did not highlight how recently the Nimrods had been available in the schools and this could well be a telling factor.

Table 14 Comparison Between Computer Usage in Accounting
and the Brand of Computer Available in the School

<u>Computer Brand Available</u>	<u>Use of Computers in Accounting</u>				
	<u>Response</u>		<u>%</u>		<u>Total</u>
	<u>Yes</u>	<u>No</u>	<u>Yes</u>	<u>No</u>	
Nimrod	16	11	59.3	40.7	100%
Microbee	16	10*	59.3	40.7	100%

* Indicates the availability of the Apple computer rather than the Microbee in one school

Note: Responses do not sum % of total responses to computer use in Accounting due to some respondents indicating the availability of more than one brand of computer in the school.

4.10 RESPONDENTS' COMMENTS

In addition to responding to the questionnaire by selecting from a list of given alternatives, some of the respondents also provided comments. These are included in the survey results merely for interest as it is recognized that a proper interview would be needed before too much relevance could be placed on them.

The largest number of comments concerned how necessary teacher's saw computer use in Accounting. While there was agreement that the use of computers was important with a 75% response that 'hands on' use of computers was very important or, at least, important, there were some differences of opinion as to whose role it was to provide this experience. One respondent considered that "the 'hands on' use was of little importance" because of the small weighting given to electronic data processing by the Secondary Education Authority. Another expressed the view that while computer skills might be important for a professional accountant, the Year 11 and 12 Accounting curriculum was not the place to develop them. It was felt, furthermore, that "the persistence of computer usage would harm Accounting in the long run by developing students who could do computer accounting but could not understand simple accounting concepts". A third opinion was that "technology should not be allowed to rule teaching". The the early level of

accounting development did not need computers and should not be forced to use them just to advance the cause of technology.

Another variable inviting comment was the matter of computer software. Although most respondents to the survey rated time constraints as the single most important factor preventing computer use, the availability of software was also a significant factor with some respondents considering this to be the only factor preventing computer applications. One teacher even considered that the apprehension about computer use in Accounting was directly related to the type of software available. It would have helped if these comments specified whether software availability was restricted by a lack of funds on the part of the school or whether it was a marketing problem.

One very positive comment worthy of inclusion in this study related to the attitudinal statement asking whether teachers were comfortable or apprehensive about using computers. The respondent considered that it was very easy to learn how to apply the computer in Accounting education and added that the more that was learnt about the use of the computer, the more satisfaction was attained in using it in teaching.

5 ANALYSIS OF RESULTS

- 5.1 Teaching Experience
- 5.2 Inadequate Inservice Training
- 5.3 Problem of Time
- 5.4 Computer Availability
- 5.5 Software Applications in Accounting

5 ANALYSIS OF RESULTS

The survey data provides some helpful answers to some of the many questions which need to be addressed if computer usage within Accounting education is to be successful.

From the analysis of the data, it appears that generally Accounting teachers are aware of the rapid changes taking place in the Business Education classroom because of the computer but the proportion of teachers making use of the computer is as yet low. Basically, this is because while there is agreement that computer skills are important in Accounting, there is some diversity of opinion as to when these skills should be developed. There are those teachers who feel that computer skills should be an important part of Accounting education in Year 11 and 12 and those who feel that the curriculum at this level should concentrate on the traditional skills and leave the acquisition of specific computer skills to be learned at a later date.

Irrespective of teacher's attitudes to computer use, there are many factors which prevent them from incorporating the computer within the Accounting curriculum. The survey data highlights that computer use in Accounting is not dependent solely on the existence of adequate hardware and software. These factors need to be fully appreciated if the level of computer usage in Accounting is to be increased.

5.1 TEACHING EXPERIENCE

It could be assumed that more recent graduates should be making more use of computers in Accounting because their exposure to them as part of their training has been more recent. This should make them more comfortable with computers and more confident about using them. The survey shows that in the classroom this is not the reality. The results of the questionnaire indicate that the percentage of experienced teachers (those who have been teaching Accounting for more than 12 years) is comparable to the percentage of beginning teachers (those teaching Accounting for less than 6 years). Surprisingly, however, beginning teachers make very little use of computers in Accounting and it is actually the more experienced teachers who tend to use them more. It could be implied from these results that teachers need to feel confident with their subject to be confident about using computers within it and that this confidence comes only with teaching experience. Not all experienced teachers, however, responded positively to using computers in Accounting which means that experience in teaching is only one factor impinging on the use being made of computers in Accounting education.

5.2 INADEQUATE INSERVICE TRAINING

Among the key factors indicated by teachers as preventing computer use in Accounting is the lack of any inservice opportunities. Over one-third of the respondents indicated the need for more inservice training. Interestingly enough, these were predominantly beginning teachers rather than experienced teachers. In fact, responses to this statement decreased proportionately to the increase in years of teaching experience. The implication is that teachers are not getting adequate training in computer use as part of their training and are, therefore, not confident about using computers in the classroom. However, as the questionnaire specified inservice training only and did not differentiate between training on-the-job and pre-service training this implication is not conclusive. Furthermore, a once-only, pre-service training is possibly not enough in the light of the technological changes taking place in society. The only conclusion that can be drawn, therefore, is that inservice training appears to be important in relation to computer usage and that at this stage it is considered inadequate.

Interestingly enough these results support the initial premise that confidence to try new innovations in education may possibly result from actual teaching experience irrespective of any exposure to computers during teacher training.

5.3 PROBLEM OF TIME

The need for more time to use computers in Accounting was also indicated by over one-third of the respondents to the survey. It was the more experienced teachers who indicated that lack of time within the curriculum was the single factor which prevented more frequent use being made of the computer within the curriculum. As this response was chosen by teachers who are actually using computers, it is a very relevant issue and it may be assumed that more time within the curriculum for computer use may result in more teachers utilizing computers in Accounting.

One weakness of the survey questionnaire and, therefore a limitation to the conclusions that can be drawn from the results, is that there was no indication of specific problems related to time and how these problems could be overcome. There was no indication, for example, whether the problem related to the time required for preparation or whether it related to the provision of more time within the syllabus itself. As the literature has pointed out, many teachers already feel that the Accounting curriculum in Year 11 and 12 is overcrowded. At this stage there is nothing in the survey results to indicate that if parts of the syllabus were removed, more use would be made of the computer in Accounting. Without more evidence, therefore, no more other conclusions, other than the time is a problem, can be drawn.

5.4 COMPUTER AVAILABILITY

In any analysis of computer use in Accounting, computer availability is a relevant factor. The number or proportion of schools with computers provides part of the answer to computer availability but equally important is information on the number of computers actually available to students within the schools.

The survey data shows that while the ratio of computers to students varies from school to school, on average, based on school enrolment sizes, there is no marked difference between those schools with an enrolment of 800-1000 students and those who have between 500-800 students. The number of computers available in these schools is between 32 and 34; on average, one computer to every 23 students. There is a significant difference, however, in the number of computers available in schools with an enrolment of less than 500 students with only 16 computers, or one computer to every 30 students, being available. It would appear, therefore, that the distribution of computers to schools is not consistent and that a number of schools have only a few computers available to a significant number of students.

While it is not possible to draw precise conclusions from this data, it could be assumed that those schools who have less computers available for student use would have less

opportunity to use them and consequently computer usage in those schools should, as a result, be lower. Surprisingly, however, there appears to be no positive correlation between the number of computers available in the school and their use in the Accounting curriculum. In fact, the survey data shows that the more computer facilities indicated, the greater the percentage of negative responses to their use was recorded. It would appear, therefore, that the use of computers in Accounting is not dependent merely on the number of computers provided and that there are other factors related to computer availability to be considered.

One such factor is the location of computers within the school. This is an important factor because it affects accessibility to them and generally inaccessible equipment reduces the possible instruction time on it.

The survey data shows that the number of computers available in a school is not necessarily comparative to the number of computers available in Business Education. While responses to computer availability at the school were generally favourable, over half of the respondents (58%) reported that no more than two computers were available for use in Business Education. The numbers of computers available at the school, therefore, give no indication to the intensity of computers to students in Accounting. If this is very low, effective computer use is not possible which may

explain the small percentage of students who use computers within Accounting. However, as the survey did not provide for responses to any general access to computers in the school if not available in the Business faculty, it cannot be positively concluded that the number of computers in Business Education is the only factor which affects the use that is made of computers in Accounting.

Results from the survey indicate that the most common brands of computers in the schools are Nimrods and Microbees. The use that can be made of the Microbee for Accounting purposes is limited by the nature of the hardware and the lack of suitable software. The Nimrod, on the other hand, is a sophisticated system with quality software available for Accounting applications. As the degree of computer use possible is related to available software, accessibility to computers is often affected by computer brands. The trend appears to be that more schools are turning to the Nimrod from the Microbee. Thus, possibly any inaccessibility to computers due to brands will be reduced. The survey data does not indicate that at this stage the brand of computer is necessarily a relevant factor of computer use; there is no correlation between positive responses to computer use and particular computer brands. The Nimrod is, however, relatively new in schools. Therefore, although not a factor in this survey, it is not conclusive that computer brands have no relevance to computer use in Accounting.

5.5 SOFTWARE APPLICATIONS IN ACCOUNTING

The availability of adequate software for computer use is considered by some to be of more importance than the availability of hardware because hardware on its own is no guarantee of computer use.

Reflective of the type of software currently on the market, most computer applications in Accounting classes relate to educational general ledger packages. Considering that the survey is at the secondary school level, it is not very surprising that educational software, rather than commercial software is being used. What is surprising is the lack of use of the spreadsheet as it is considered one of the most flexible tools for use in Accounting courses. Spreadsheets do, however, require a great deal more time and creativity than merely illustrating ledger packages. Taking into consideration the positive response to time constraints, the popularity of ledger packages is understandable.

The survey data shows that there is not a great range of software available in secondary schools at present. It is assumed that this is due to the fairly recent arrival of educational software on the market and that as quality software becomes more readily available, it will be reflected both in the range of software available at the school and the use to which it is put in Accounting.

Although the literature has shown that there are many areas within the syllabi of Year 11 and 12 Accounting in which one would expect computers to have a role to play, the results of the survey do not give any indication of specific areas within the curriculum where the computer is being used. The questionnaire provided a broad list of activities that could be related to computer use in Accounting. Provision was also made to enable respondents to detail any other uses made of the computer. In completing the survey respondents, generally tended to chose one of the list of alternatives provided and not provide details of any other computer activities. Consequently, the results, while specifying broad computer applications do not give any details relating to specific areas within the Accounting curriculum.

6 CONCLUSIONS

6 CONCLUSIONS

The purpose of this research was to survey computer usage in Year 11 and 12 Accounting in Western Australian secondary government schools. To do this a series of questions were asked to test the degree to which the computer is being applied in the curriculum. It was anticipated that if there was no evidence of computer usage in Accounting education, answers to the research questions should help explain why.

The first question posed was the extent to which computer literacy is considered a part of the Accounting curriculum. Within the context of the research, computer literacy was seen as "an informed state of awareness of computer technology" and included the principles of operation and application of the computer.

The literature revealed that there has been some direction given to computer usage in Accounting by the Secondary Education Authority (SEA). The extent to which computer literacy is seen as part of the Accounting curriculum is highlighted in the educational objectives of the Year 11 and 12 Accounting syllabi. These objectives provide for raising students' awareness of electronic data processing and developing computational skills.

It is specified, however, that electronic data processing is to be used at an elementary level only and when the time weighting for this topic is considered it does not appear that computer literacy has a high profile at this level of Accounting education. Only 5% of course time in Year 11 is devoted to electronic data processing and no specified time weighting exists in the Year 12 syllabi. The reasons for this are not explained by the SEA. The conclusions drawn, therefore, suggest that while it is recognized that computer skills are necessary in Accounting, it does not appear that Year 11 and 12 Accounting is considered to be the place to develop them. For this reason, computer literacy, while certainly a consideration in Year 11 and 12 Accounting, does not feature to a large extent as part of the curriculum.

Another question asked was whether Accounting teachers are actually using the computer in Accounting education. A summary of the survey data suggests that computers are being used by a number of teachers for a variety of tasks even though for many teachers the number of computers available to them is insufficient. Generally, however, the research indicates that while computers are being used in Accounting, the level of use is modest.

In relation to the specific uses made of computers within the Accounting curriculum, it was found that not only is the use that is made of the computer fairly insubstantial, it is

also inconsistent. Generally computers are used irregularly and in rather an 'ad hoc' fashion. Moreover, computer use is not related to specific topics within the curriculum and computer activities are often totally unstructured.

Generally, computer use encompasses basic record keeping activities, not on a regular basis but simply 'as the need arises'. An explanation for this is possibly the fairly insubstantial time weighting specified for computer applications by the SEA. It is not conclusive, however, that computer usage in Accounting would be more prevalent or more specific if the expectations of the SEA were higher.

What is conclusive is that there are many factors which prevent the utilization of computers within the Accounting curriculum. Contrary to popular belief, the availability of hardware is not considered to be the key factor in computer use. Apart from hardware there are other considerations if effective computer use is to be guaranteed. These include the accessibility of the hardware and the provision of adequate software. More importantly, they include the attitudes of Accounting teachers to computer use, as in the final analysis it is these attitudes which will determine what is actually being done within the classroom. Where computers are not being used in Accounting, the problems of time and inadequate inservice training are also cited as relevant factors. If we consider that all of these factors impinge to some extent on the degree to which the computer

can be applied in Accounting, it helps to explain why computer applications within the Accounting curriculum are at present limited.

The survey data shows that resources available for teachers to integrate computer usage within the curriculum, are increasing. Certainly hardware provisions have increased as a result of the recent commitments by the Ministry of Education. But, while it is not possible to draw precise conclusions from the survey, it appears that there are still many schools which have only a few computers for significant numbers of students. Moreover, even though the provision of computers is now considered from an educational viewpoint rather than from a technical one, there is still a large proportion of hardware which is not capable of the software application required of it. This prevents teachers from making use of computer software within the curriculum. Therefore, although it is recognized that hardware is not the only factor impinging of computer use in Accounting, it is certainly one factor limiting its use.

The survey data also shows that at present there is not a great deal of software available in secondary schools. Whether this is due to a lack of funds or because the available software is not adaptable to the computer brand cannot be determined conclusively by this survey. But whatever the reason, the lack of software is yet another

restriction on computer use. With the trend away from the Microbee to the more sophisticated Nimrod, and considering the changes occurring in educational software, it is possible that software restrictions may be overcome.

Another restriction on computer usage relates to the fact that many teachers are not convinced of the benefits which computer applications can provide. The question of perceived benefits as a result of computer use in Accounting was the final question posed by the research. The survey data indicates that the most beneficial use of computers in Accounting education is seen in the reinforcement of basic concepts. While agreeing that computer use was very important or at least important, teachers were wary about using computers as much more than a reinforcing tool. Some teachers felt that computers could harm Accounting by developing students who could run computer software but were unable to understand simple accounting concepts. This would explain why mostly computer use relates to reinforcing the principles of basic record keeping.

In summary, therefore, the research shows that while computer literacy has certainly been considered in Accounting education and while some teachers make use of computers in the curriculum, the use made is neither specific nor consistent. This is because there are many factors which impinge on the use that can be made of the

computer in Accounting. Apart from the problems of hardware and software are factors relating to time for computer use, inservice training on computer applications and the attitude of teachers to computer use. All these factors affect the ability to incorporate computers within the Accounting curriculum. In the final analysis it appears that while computer skills might be important for the Accounting profession, it is not the province of the Year 11 and 12 Accounting syllabi to develop them. At this early level of accounting development too much computer use might advance the cause of technology but would not advance the cause of Accounting.

7 RECOMMENDATIONS

7 RECOMMENDATIONS

If computer literacy is indeed a consideration in Year 11 and 12 Accounting in Western Australian government secondary schools, the following recommendations should be considered in order that those factors which impinge upon successful computer usage in the Accounting curriculum can be minimized.

1. The Secondary Education Authority needs to provide, not only broad directives relating to computational skills in the Year 11 and 12 Accounting syllabi, but also give more direction to achieving these directives by specifying those areas within the curriculum in which computers should play an educational role.
2. As computer education supposes a high degree of 'hands on' access which requires a sufficient number of resources, efforts should be made by the Ministry of Education to ensure that the intensity of computer availability to students is viable.
3. As successful computer application in Accounting Education is related to the availability of instructional software, the Ministry of Education must ensure that quality software resources are available for use in the Accounting curriculum. This may include

financing the production of educational software if such resources are not available on the market.

4. If computer use in Accounting ultimately depends on what is done by Accounting teachers in the Accounting classroom, then consideration must be given to the human problems which impinge on the degree to which computer applications are possible within the Accounting curriculum. Opportunities must be made available by the Ministry of Education for adequate inservice training in both software and hardware to assist Accounting teachers to make effective use of the computer within Accounting education.
5. While it is the province of Year 11 and 12 Accounting within the secondary school to introduce students to the principles of Accounting concepts rather than provide them with the computer skills required by the Accounting profession, it is, nevertheless, prudent for educators to familiarize students with the impact of computers on society and provide them with some computational skills. If students use the computer within the curriculum as a learning aid, it will not only enhance their knowledge of Accounting but also make them computer literate; a realistic skill in the light of the advances made by computer technology.

8 LIMITATIONS OF THE RESULTS

8 LIMITATIONS OF THE RESULTS

Interpretation of the findings must be qualified by a number of points as there are significant limitations to this study besides the inability to make statistical inferences.

Firstly, schools included in the survey were not randomly selected. Rather all secondary schools in the metropolitan area were included in the sample in order to avoid any possible inherent sample biases. The survey data is based, therefore, on the results of metropolitan high schools only and may not be representative of all schools in Western Australia. Considering geographical factors can influence school profiles, a follow-up study of other secondary schools in Western Australia is necessary in order that more reliable generalizations can be made.

In addition, results could be biased as the analysis is based on the responses received. The test for nonresponse bias revealed no significant differences between those respondents who replied early and those respondents who replied late. However, those individuals with strong feelings about computer use in Accounting are probably more likely to respond than those who do not. It cannot be generalized, therefore, that responding and non-responding schools do not differ significantly in the use that they make of the computer.

There has, moreover, been no practical safeguard to protect against intentional or unintentional bragging by respondents or against reporting intentions as accomplishments. This could also have impaired the reliability of the results.

Finally, a more fundamental limitation to the research is that there is no previous study on which to base the survey results. This study has actually 'broken new ground' and provided data not previously available to Accounting teachers in Western Australia. Future research studies will have a foundation on which to base their findings. The results of this research, therefore, although proving that computers are available in viable quantities in at least 44% of the schools cannot, unfortunately, conclude emphatically that computer facilities have increased or are increasing.

9 SUMMARY

9 SUMMARY

Historically, educational systems have been reasonably successful in resisting change in policies and practices. Recently, however, strong social forces have coalesced to make change in education a much more frequent reality. One such change is the use of computers in education. Computers are an important reality of this "information society", particularly in the context of Accounting where the technology revolution has radically affected the environment in which accounting operates. Computer literacy has become an essential skill for accountants and Accounting courses have been altered to enable students to be familiar with computer applications.

The focus of this research was to survey computer usage in Year 11 and 12 Accounting in Western Australian government secondary schools. A questionnaire was designed to measure the degree of computer use in the curriculum and if computer use was not evident to explain why not.

The results of the study indicate that schools have taken some steps to familiarize the student with computer use in Accounting. The need for computer literacy has, however, been recognized in more in theory than in practice. While the Secondary Education Authority provides for computer use in Accounting in the educational objectives of the course,

the degree of application prescribed is rather low. And among Accounting teachers, it would appear that while there is agreement about the need for computer skills, the degree to which this should be taken at the secondary level remains a point of dissension.

As has been highlighted by the research, computer use in Accounting is not without problems. Schools where the computer is not currently being used indicate insufficient time, lack of quality software and insufficient inservice training as impinging on the use of computers in the curriculum. It would seem, therefore, that the ability to keep pace with the technological revolution rests, to a large extent, outside of the control of the teachers in the schools.

It is evident that certain factors exist which prevent teachers from incorporating computer use within Accounting education. Firstly, it would appear that computer resources are not provided uniformly nor equitably. Facilities are evident in some schools but not in others. Furthermore, the use of the computer is not dependent on more than the mere availability of hardware as actual computer applications are often restricted by inadequate software. Even where the resources are available, computer use is inconsistent within schools in either the time devoted to it or in the way in which it is applied. The reason for this seems to be that,

irrespective of resources, the actual use made of the computer in Accounting is, in the final analysis, dependent on the Accounting teacher.

The research concluded that generally, given the current rate of computer usage in the secondary school Accounting curriculum, it seems reasonable to expect that computer utilization will increase as schools equip themselves with the appropriate resources, as better quality software emerges and as adequate provisions to time and inservice training are made. Possibly, as teachers make more use of computers, computers should become more second-nature to them, with the result that they will become more positive about their use.

A follow-up study to this research appears appropriate. It is envisaged that the survey of computer use in Year 11 and 12 Accounting should be expanded to include all government secondary schools in Western Australia offering Accounting at this level to test whether the generalizations of this study can be applied state wide. A survey of private schools in Western Australia would also be educationally beneficial to determine whether the factors impinging on computer use in private schools are the same as those which have been highlighted in this report.

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11 APPENDICES

- Appendix 1 - Questionnaire
- Appendix 2 - Covering Letter
- Appendix 3 - Follow-up Letter
- Appendix 4 - Survey Acknowledgement
- Appendix 5 - Computer Availability in Schools
Based on Stratification of School
Size By Enrolment
- Appendix 6 - Computer Availability in Business
Education Based on Stratification
of School Size By Enrolment

QUESTIONNAIRE (Appendix 1)

SURVEY OF ACCOUNTING TEACHERS IN WESTERN AUSTRALIAN SECONDARY SCHOOLS

1. This survey, concerned with determining computer use in Year 11 and 12 Accounting in Western Australian Secondary Government Schools, has been designed as a **Questionnaire**.
2. The Questionnaire, consisting of 8 pages, has 4 parts:
Part 1 - Personal details of the Accounting teacher.
Part 2 - Administrative details of the school.
Part 3 - Computer availability at the school.
Part 4 - Teacher use of computers in Accounting.
3. To save time and facilitate the collation of responses, no long written answers are required.
4. Please complete the questionnaire by **30 September, 1989**. A stamped addressed envelope has been provided for your convenience.
5. All replies to this questionnaire are confidential and anonymity is guaranteed. For **administrative purposes** only, please complete the name of the school below.

THANK YOU FOR YOUR CO-OPERATION IN THIS QUESTIONNAIRE.

PLEASE TURN OVER TO PAGE TWO.

Name of School I _ I _ I _ I _ I _ I _ I _ I _ I _ I _ I _ I _ I _ I _ I _ I _

(To be detached immediately on receipt of returned questionnaire)

PAGE ONE

PART 1 Personal Details of the Accounting Teacher

C1,2 [][]

- (1) **Teaching Qualifications** (please tick your highest teaching qualification):

Teachers' Certificate []
 Teachers' Higher Certificate []
 Diploma of Teaching []
 Bachelor of Education []
 Other Not Included Above []

C3 []

Other (please specify):

- (2) **Number of years you have been teaching:**
 (please specify)

[][]

C4,5 [][]

- (3) **Number of years you have been teaching Accounting:**
 (please specify)

[][]

C6,7 [][]

- (4) **Number of years you have been teaching Accounting at your present school** (please specify):

[][]

C8,9 [][]

- (5) **Number of Accounting classes you teach at present:**
 (please specify)

[]

C10 []

PLEASE TURN OVER TO PAGE THREE

PAGE TWO

PART 2 Administrative Details of the School**(6) Size of School (please tick):**

over 1000 students	<input type="checkbox"/>	<input type="checkbox"/>
between 800-1000 students	<input type="checkbox"/>	<input type="checkbox"/>
between 500-800 students	<input type="checkbox"/>	<input type="checkbox"/>
less than 500 students	<input type="checkbox"/>	<input type="checkbox"/>

C11 ☐**(7) Number of teachers in Business Education:
(please specify for each)**

full-time teachers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
part-time teachers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

C12,13 ☐ ☐C14,15 ☐ ☐**(8) Number of Accounting classes (please specify
for each)**

Year 11 classes	<input type="checkbox"/>	<input type="checkbox"/>
Year 12 classes	<input type="checkbox"/>	<input type="checkbox"/>

C16 ☐C17 ☐**(9) Number of Business Education teachers teaching
Accounting (please specify for each):**

Year 11 classes	<input type="checkbox"/>	<input type="checkbox"/>
Year 12 classes	<input type="checkbox"/>	<input type="checkbox"/>

C18 ☐C19 ☐**(10) Maximum number of students in a class:
(please specify for each)**

Year 11 classes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Year 12 classes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

C20,21 ☐ ☐C22,23 ☐ ☐**PLEASE TURN OVER TO PAGE FOUR****PAGE THREE**

PART 3 Computer Availability at the School

- (11) How many computers are available for teaching purposes at the School? (please specify)

[][]

C24,25 [][]

(Note: do not include administrative computers)

- (12) What types of computers are available for teaching purposes at the School? (please tick)

Microbee	[]	C26	[]
Nimrod	[]	C27	[]
IBM	[]	C28	[]
Apple	[]	C29	[]
Other IBM Compatible	[]	C30	[]
Acorn	[]	C31	[]
Commodore 64	[]	C32	[]
Other Not Included Above	[]	C33	[]

- (13) If the School has an overall computer policy, who determines this policy? (please tick)

Senior Administration	[]	C34	[]
School Management Committee	[]	C35	[]
Senior Master Maths/Computing	[]	C36	[]
Senior Accounting Staff	[]	C37	[]
School Development Officer	[]	C38	[]
Other Not Included Above	[]	C39	[]

- (14) If the School has a computer co-ordinator, to which faculty is this person attached? (please tick)

Maths/Computing	[]	C40	[]
Science	[]	C41	[]
Social Sciences	[]	C42	[]
Business Education	[]	C43	[]
Other Not Included Above	[]	C44	[]
No Co-ordinator	[]	C45	[]

PLEASE TURN OVER TO PAGE FIVE

PAGE FOUR

- (15) How many computers are housed within the Business Education Faculty? (please specify) [] [] C46,47 [] []
- (16) What type of computer is housed within the Business Education Faculty? (please tick)
- | | | | |
|--------------------------|-----|-----|-----|
| Microbee | [] | C48 | [] |
| Nimrod | [] | C49 | [] |
| IBM | [] | C50 | [] |
| Apple | [] | C51 | [] |
| Other IBM Compatible | [] | C52 | [] |
| Acorn | [] | C53 | [] |
| Commodore 64 | [] | C54 | [] |
| Other Not Included Above | [] | C55 | [] |
- (17) How many printers are available in the Business Education Faculty? (please specify) [] [] C56 []
- (18) How are computers housed within Business Education? (please tick)
- | | | | |
|-------------------------------|-----|-----|-----|
| Located in one central area | [] | C57 | [] |
| Spread throughout the Faculty | [] | | |
- If SPREAD THROUGHOUT THE FACULTY please specify the maximum number of computers located in any one area:
- [] [] C58,59 [] []
- (19) In Business Education, for which purposes is the computer used? (please tick)
- | | | | | |
|--------------------------|---------|--------|-----|-----|
| Typewriting | Yes [] | No [] | C60 | [] |
| Word Processing | Yes [] | No [] | C61 | [] |
| Data Processing | Yes [] | No [] | C62 | [] |
| Other Not Included Above | Yes [] | No [] | C63 | [] |
- (20) The use of computers within the Business Faculty is dependent on? (please tick)
- | | | | | |
|---------------------------|---------|--------|-----|-----|
| Business Education Policy | Yes [] | No [] | C64 | [] |
| School Computer Policy | Yes [] | No [] | C65 | [] |

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PART 4 Teacher Use of Computers in Accounting

(21) As an Accounting teacher (please tick):

Are you comfortable with using computers? []
Are you apprehensive about using computers? []

C66 []

(22) How important do you feel 'hands on' computer use
is in the Accounting programme? (please tick)

Very important []
Important []
Moderately important []
Of little importance []

C67 []
C68 []
C69 []
C70 []

(23) Do you use computers in the Accounting programme?
(please tick)

Yes [] No []

C71 []

If YES please continue to Question 24.
If NO please move straight to Question 30.

(24) In which Year level do you use computers?
(please tick)

Year 11 only []
Year 12 only []
Year 11 and 12 []

C72 []
C73 []
C74 []

(25) What time weighting do you give computer use?
(please specify as required)

Year 11 1-5% []
5-10% []
10% or more []

C75 []

Year 12 1-5% []
5-10% []
10% or more []

C76 []

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(26) How often do students in Accounting use computers?
(please tick)

On a weekly basis	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
In certain topics only	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>

C77 ☐
C78 ☐

If ON A WEEKLY BASIS please specify the number of
hours per week:

☐

C79 ☐

If IN CERTAIN TOPICS ONLY please specify the topics:

C80,81 ☐ ☐

(27) For which activities do students use computers in
Accounting? (please tick those applicable)

Revision of basic concepts	<input type="checkbox"/>
Business simulation activities	<input type="checkbox"/>
Spreadsheet applications	<input type="checkbox"/>
General ledger applications	<input type="checkbox"/>
Other Not Included Above	<input type="checkbox"/>

C82 ☐
C83 ☐
C84 ☐
C85 ☐
C86 ☐

Other (please indicate which activities):

C87,88 ☐ ☐

(28) What software do you use for computer accounting?
(please list)

C89,90 ☐ ☐

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- (29) What benefits do you feel result from students use of computers in Accounting? (please tick those which are applicable)

Development of thinking/problem solving skills	[]	C91	[]
Individualized instruction	[]	C92	[]
Development of computer literacy skills	[]	C93	[]
Reinforcement of basic accounting concepts	[]	C94	[]
Other Not Included Above	[]	C95	[]

Other (please indicate):

C96, 97 [] []

- (30) What single factor prevents you using computers more frequently? (please tick whichever applicable)

Availability of computer hardware	[]	C98	[]
Accessibility to computer hardware	[]	C99	[]
Availability of appropriate computer software	[]	C100	[]
Lack of time within the curriculum	[]	C101	[]
Lack of knowledge about computers	[]	C102	[]

- (31) Which of the following factors would make it easier for you to use computers in Accounting? (please tick whichever applicable)

More time for preparation	[]	C103	[]
Greater inservice opportunities	[]	C104	[]
Having greater access to a computer	[]	C105	[]
Being able to take a computer home	[]	C106	[]

THIS IS THE END OF THE QUESTIONNAIRE.
THANK YOU AGAIN FOR YOUR CO-OPERATION.

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COVERING LETTER (APPENDIX 2)

20 Lobelia Drive
GREENMOUNT 6056

19 September 1989

The Accounting Teacher
(Through The Principal)

Dear Accounting Teacher

The attached questionnaire is an attempt to survey computer usage in Year 11 and 12 Accounting in Western Australian Secondary Government Schools. It is part of a research study being conducted at the Bachelor of Education (Honours) level through the Western Australian College of Advanced Education.

The increasing use of computers by business has revolutionized accounting with the result that computer literacy has become an essential skill for accountants. As a result, students in accounting courses need a basic understanding of computers and Secondary Education Authority (SEA) syllabi provide for this within the Accounting curriculum. Although Accounting teachers generally agree that students should have the opportunity to use the computer in Accounting, many have difficulties trying to put this into effect.

The purpose of this study is to determine whether computers are actually being used in the Accounting curriculum. It is hoped that by highlighting what other accounting teachers are doing in similar situations, the results may assist all accounting teachers in formulating future computer usage programmes.

As this is a worthwhile project, I trust you will give the questionnaire your most serious consideration and thank you most sincerely for your co-operation.

Yours sincerely

Christine Critch

FOLLOW-UP LETTER (Appendix 3)

20 Lobelia Drive
GREENMOUNT 6056

30 September 1989

The Accounting Teacher
(Through The Principal)

Dear Accounting Teacher

Enclosed please find a copy of a questionnaire which was posted to you four weeks ago. The questionnaire is a survey of present trends in computer usage in Year 11 and 12 Accounting in Western Australian Secondary Government Schools. It concerns a matter which is very important to Accounting teachers and the results of the survey should assist all accounting teachers by highlighting what others are doing in similar situations.

I appreciate that time is very scarce. For this reason the questionnaire has been streamlined to require a minimum of time for completion. Please be assured that all replies to the questionnaire will be treated confidentially.

May I urge you to give your most serious and urgent consideration to the questionnaire by completing it and returning it in the stamped addressed envelope supplied before 24 October, 1989.

Yours sincerely

Christine Critch

SURVEY ACKNOWLEDGEMENT (Appendix 4)

20 Lobelia Drive
GREENMOUNT 6056

30 September, 1989

The Accounting Teacher
(Through The Principal)

Dear Accounting Teacher

Thank you most sincerely for completing and returning the questionnaire concerned with surveying present trends in the implementation of computer usage within the Year 11 and 12 Accounting syllabus of Western Australian Secondary Government Schools.

The timing of this survey must have presented some difficulties for teachers and, therefore, your prompt and urgent consideration of the survey is much appreciated.

Yours sincerely

Christine Critch

**COMPUTER AVAILABILITY IN SCHOOLS BASED ON STRATIFICATION OF
SCHOOL SIZE BY ENROLMENT* (APPENDIX 5)**

No. of Computers in the School	Over 1000 Students	Between 800-1000 Students	Between 500-800 Students	Below 500 Students	Total No.
3	-		1		1
5	-			1	1
9	-	1			1
10	-	1			1
11	-			1	1
12	-			1	1
15	-			1	1
17	-			1	1
18	-	1		1	2
20	-	1	1	1	3
25	-	1	1		2
30	-	2		1	3
32	-	1	1		2
35	-	1	1		2
40	-	2	3		5
45	-		1		1
48	-		1		1
50	-	1	1		2
54	-	1			1
56	-	1			1
<hr/>					
Responses	0	14	11	8	33
Computers	0	449	378	128	955
Average	0	32	34	16	-
Response %	0	42.4	33.4	24.2	100%

* This information is summarized in Table 9 of the Thesis Report

**COMPUTER AVAILABILITY IN BUSINESS EDUCATION BASED ON
STRATIFICATION OF SCHOOL SIZE BY ENROLMENT* (APPENDIX 6)**

No. of Computers in Business Education	Over 1000 Students	Between 800-1000 Students	Between 500-800 Students	Below 500 Students	Total No.
0		5	4	2	11
1	1	3	2	2	8
2				2	2
3		1			1
4		1			1
5				2	2
6		1			1
10		2	2		4
14			1		1
20				1	1
25		1			1
28			1		1
31		1			1
40			1		1
Responses	1	15	11	9	36
Computers	1	92	104	36	233
Average No.	1	6	9	4	-
Response %	2.8	41.7	30.5	25.0	100%

* This information is summarized in Table 9 of the Thesis Report